The

CADD/GIS

Technology

Center

PROPOSED

FY01 Project Book

April 2000

CADD GIS TECHNOLOGY CENTER

for facilities, infrastructure, & environment

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INITIATIVE: INTERNAL PROCESS

GOAL: MARKET THE CENTER TO INCREASE THE FIELD'S KNOWLEDGE OF THE CENTER'S PRODUCTS AND SUCCESSES.

PROJECT #: 96.001

TITLE: Publishing the CADD/GIS Bulletin (WEB)

ORIGINATOR AND SERVICE PROPONENTS:
U.S. Army Engineer Research and Development Center, ATTN: The CADD/GIS Technology Center (Ms. Laurel Gorman), 3909 Halls Ferry Road, Vicksburg, MS 39180; (601)634-4484

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REQUIREMENT AND OBJECTIVES:
The Center staff is responsible for disseminating CADD/GIS information as part of its clearinghouse function. It is pertinent to keep field users abreast of CADD/GIS technologies and this is made possible via the newsletter. The bulletin is one method of a multi-functional approach to communications of CADD/GIS information.

The objectives are: (1) to publish regular and special editions of the CADD/GIS Bulletin and (2) to encourage field users to provide feedback on CADD/GIS implementations and lessons learned.

JUSTIFICATION:
The CADD/GIS Bulletin provides a necessary communication link among the CADD/GIS users. Information exchange is a critical factor in disseminating information among the CADD/GIS users.

APPROACH:
Provide articles from the Center staff and field users on CADD/GIS related issues and publish them in a newsletter format. Follow the established outline that provides the readers with pertinent information on the Center's products and activities. Each newsletter will include field projects using CADD/GIS technologies, lessons learned, updates on Center products, and the Center Calendar of Events. Additionally, promote field user participation in providing articles for the CADD/GIS Bulletin.

COST:
$20,000.00

PROJECT #: 96.001
TITLE: Publishing the CADD/GIS Bulletin - Page 2

PRODUCT:
A quarterly newsletter in an electronic version will be posted on the Internet. The projected schedule and theme of specific newsletter are:

April Issue - Updates for CADD/GIS/FM Standards and new project applications.

September Issue - New CADD/GIS Technology and FUG Activities

CUSTOMERS:
CADD/GIS user community.

REMARKS:
This is an ongoing activity. The newsletter is available only on the Center's Web site (http:\\tsc.wes.army.mil).

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Other Federal Agencies - 29 offices

What is the measurable time or cost savings with the implementation/use of this product?
NA for mission support projects.

What, if any, non-quantifiable benefits will be realized?
This project will benefit agencies far beyond Center-affiliated agencies.

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

Are hardware or software upgrades required?
No

PROJECT #: 96.001
TITLE: Publishing the CADD/GIS Bulletin - Page 3

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
No

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 96.003

TITLE: Federal Geographic Data Committee (FGDC) Participation

ORIGINATOR AND SERVICE PROPONENTS:
U.S. Army Engineer Research and Development Center, ATTN: The CADD/GIS Technology Center (Ms. Laurel Gorman), 3909 Halls Ferry Road, Vicksburg, MS 39180; (601)634-4484.

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REQUIREMENT AND OBJECTIVES:
To facilitate user participation from an installation/facilities (non-battlefield) perspective in the activities of the Federal Geographic Data Committee (FGDC), which was established by OMB Circular A-16, "Coordination of Surveying, Mapping, and Related Spatial Data Activities." This would include development and coordination of facilities related NSDI standards through the FGDC development process.

The objectives are to ensure that the interests of the various elements of the CADD/GIS user community are fully represented in FGDC activities, including the development and coordination of installation-level standards throughout the various FGDC subcommittees, which relate to comparable disciplines/Field Users Groups. The purpose of this participation will be to influence Federal policies and standards for spatial data, insure compatibility between Federal and industry spatial data efforts, and incorporate these policies and standards into the Center's standards initiatives.

JUSTIFICATION:
Circular A-16 mandates coordination of Federal Agency geographic data activities. This includes many of the thematic layers (cartographic, cadastral, ground transportation, etc.) as found in present CADD, GIS, LIS, and AM/FM systems under the Center's charter. Benefits include Federally-approved and potentially nationally recognized data standards that facilitate data sharing between agencies, reduced duplication of effort in collection of geographic data, and avoidance of resource expenditures used for the development of potentially conflicting standards, and common standards to make the sharing and use of spatial data possible. Formal approval

and recognition by Federal and National geospatial standards organizations for the Center's GIS Standards activities would also be accomplished.

APPROACH:
The Center will coordinate and fund participation for agency-sponsored representatives at FGDC Subcommittee and Working Group meetings. Many of these groups are developing and distributing draft standards for thematic geospatial data sets. The Center will actively participate in the resolution of action items addressed by each subcommittee. The Center will continue to support the Facilities User Group that focuses on installation level standards and GIS needs. Furthermore, the Center will support the Facilities User Group in the development of facilities-related NSDI standard(s) including the development and coordination of standard(s) project proposals, leadership of a project team on the development of proposed standards(s), coordination of standard(s) through the FGDC, and resolution of comments from a formal public review of standards(s). The Center will also coordinate with other affiliated agencies regarding physical models for geospatial data standards.

COST: $75,000

PRODUCT:
A vehicle for participating in the standards development process mandated by Circular A-16 and a voice in the development of standards that will impact the spatial data interests of the CADD/GIS user community. The FY01 products/deliverables will be the evaluation and input into the FGDC Standards as proposed and put forward by the FGDC Working Groups and Subcommittees. The standards now under consideration for FY00 (but not limited) to are listed below. Please note the standard is listed in Italics followed by the responsible FGDC group.

1. *Encoding Standard for Geospatial Metadata*, Clearinghouse Working Group
2. *Address Content Standard*, Cultural and Demographic
3. *Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing Metadata*, Standards Working Group, Imagery Subgroup
4. *Earth Cover Classification System*, Earth Cover Working Group
5. *Geologic Data Model*, Geologic Subcommittee
6. *Geospatial Positioning Accuracy Standard, Part 5: Standard for Hydrographic Surveys and Nautical Charts*, Bathymetric Subcommittee
7. *Governmental Unit Boundary Data Content Standard*, Cultural and Demographic
8. *NSDI Framework Transportation Identification Standard*, Ground Transportation Subcommittee
9. *Biological Nomenclature and Taxonomy Data Standard*, Biological Data Working Group

CUSTOMERS:
CADD/GIS user community, other Federal and State agencies, municipalities, and local governments.

PROJECT #: 96.003
TITLE: Federal Geographic Data Committee (FGDC) Participation - Page 3

REMARKS:
This is an ongoing activity that can be expected to continue into the future. There are additional unknown, unfunded requirements to review, evaluate and integrate emerging FGDC standards with the Spatial Data Standards. There are also additional unknown, unfunded requirements to review, evaluate, and compose geospatial data standards associated with other Center-coordinated data standardization programs.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Other Federal Agencies - 29

What is the measurable time or cost savings with the implementation/use of this product?
NA for ROI analysis, FGDC participation is required to support and propagate the Center's Standards suite. Utilizing the FGDC reduces the cost of developing similar thematic data standards in the SDSFIE. To date, the SDSFIE has incorporated 3 approved FGDC standards including Vegetation Classification, Wetlands and Deep Water Habitats, and Soils Data.

What, if any, non-quantifiable benefits will be realized?
This project will benefit all installations implementing the SDSFIE and agencies far beyond the Federal government i.e. State and local governmental agencies as well as the private consulting firms.

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

Are hardware or software upgrades required?
No

PROJECT #: 96.003
TITLE: Federal Geographic Data Committee (FGDC) Participation - Page 4

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
No

INITIATIVE: INTERNAL PROCESS

GOAL: MARKET THE CENTER TO INCREASE THE FIELD'S KNOWLEDGE OF THE CENTER'S PRODUCTS AND SUCCESSES

PROJECT #: 96.011

TITLE: Center Internet & Intranet Technology

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
The Center produces a large volume of information every year. This information must be disseminated quickly, economically, and efficiently. The Internet is currently the most efficient method for disseminating information. Information placed on the web is instantly available worldwide. As Internet technology continues to grow and improve, the Center must keep up with the changes to insure that our web site does not become outdated. There is a requirement to upgrade the development tools used by the Center to develop and maintain the Web site, particularly with regard to internet-database integration tools. Also, as other organizations develop web-based information that is pertinent to the Center's customers (such as The Foundation Knowledge Web site developed by the Navy), the Center will host and assume a maintenance role for that information. The Web site needs to be expanded to provide more examples of lessons-learned, success stories, and projects. The objective of this project is to disseminate volumes of information by exploiting state-of-the-art web-based technology.

JUSTIFICATION:
Customers need and demand quick and easy access to the CADD/GIS Technology Center's products, data, and information. To keep up with our customers' requests the Center must continue to improve and maintain the Web site. Currently, the Center uses basic text editing tools to maintain the Web site. Development tools used by the Center to develop and maintain the Web site must be upgraded, particularly with regard to web-database integration tools.

PROJECT #: 96.011
TITLE: Center Internet & Intranet Technology - Page 2

APPROACH:
Maintain up-to-date information on the web. As web technology changes, update our user interface to make it easier and faster for users to find information. As information grows, update our hardware and software to maintain sufficient speed and storage. Acquire and use state-of-the-art COTS tools to develop and maintain the Web site.

COST:

Software:	$ 10,000
Hardware:	$ 50,000
Labor:	$ 85,000
	$145,000

PRODUCT:
A state-of-the-art web site.

CUSTOMERS:
Facilities, Infrastructure, and Environmental communities.

REMARKS:
Continuation of FY 99 Project 96.011

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Not required.

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 96.013

TITLE: Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE)

ORIGINATOR:
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REQUIREMENT AND OBJECTIVES:
Continue development and testing of the Geographic Information Systems (GIS) Spatial Data Standards for federal partners, commercial/private concerns, government installations and Civil Works activities.

JUSTIFICATION:
The SDSFIE provides a common format for the development of GIS thereby cutting costs and allowing for the sharing of data sets among federal partners, commercial/private concerns, and government installations.

APPROACH:
Development and refinement of the SDSFIE will continue for several years (at the pace available funds permit), to the extent additional requirements are identified, and to the extent coordination with other Federal GIS Standards initiatives dictate.

a. Component 1 - SDSFIE Customer Service and Evaluation/Incorporation of Comments. Maintain, upgrade, and provide monthly project development updates and information on the Center's SDSFIE and "Project" Internet Web Sites. Maintain a database

containing SDSFIE comments/questions, and Center replies/resolutions. Update the Center's SDSFIE Internet Web Site. Review, research, answer comments and questions generated by customers concerning the SDSFIE, and update SDSFIE as necessary to incorporate SDSFIE customer comments and requests. Develop technical guidance for distribution of CD and posting on the Center's Web site.

b. Component 2 - Update SDSFIE Symbology. Develop new symbols (in AutoCAD, MicroStation, ARCINFO 7.X, ARCINFO 8.X, and ArcView digital formats) for point features not already having a symbol. Begin the review and incorporation of NIMA symbols into the SDSFIE. Update technical guidance concerning the SDSFIE Symbology and the use of the SDSFIE symbol sets.

c. Component 3 - Develop and Provide SDSFIE Implementation Instruction & Training. Update course materials and provide workshops concerning the implementation of the SDSFIE on COTS GIS platforms. Update training CDs distributed at the workshops.

d. Component 4 - Review, Update, and Test SDSFIE. Review, update (using "Maintainer"), and perform QA/QC testing of SDSFIE aspects of the SDSFIE/FMSFIE database, Browser, Generator, FilterMaker, and other SDSFIE software applications. Review and update SDSFIE related "Filters" and technical content. Test SDSFIE/FMSFIE Generator, GeoMedia Generator, and GeoDatabase Generator for each release. Investigate the incorporation of new data types (e.g., ESRI Routes and Regions) into SDSFIE data model.

e. Component 5 - SDSFIE Related Meetings and Briefings. Attend meetings concerning use of GIS and the SDSFIE. Develop and provide SDSFIE related briefings at the Center, and at various conferences, installations, districts, and meetings (to the extent of available funds). Host meetings with small groups of technical experts (to the extent available funds permit) for the review and expansion of the SDSFIE technical content. Provide a Center representative at Marine Corps GIS User Group meetings.

f. Component 6 - Develop SDSFIE ANSI Standard. Provide support for the adoption of the SDSFIE as an ANSI Standard.

g. Component 7 - Build Hydrography Filter. Review USACE, NOAA, and FGDC hydrography related features and data requirements. Expand the SDSFIE as required. Work with TEC to provide a CADD and GIS format in both Intergraph and ESRI platforms for distribution to NOAA and USACE districts. Provide limited assistance to USACE Districts in implementing the SDSFIE using the Hydrography Filter. Prepare "white paper" technical documentation.

h. Component 8 - Expand Air Transportation Data Standards. Complete the review of military, FAA, and commercial airport air transportation related data requirements and standards.

PROJECT #: 96.013
TITLE: Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) – Page 3

Expand the SDSFIE/FMSFIE as required. Prepare "white paper" technical documentation concerning the SDSFIE air transportation standards.

i. Component 9 - Expand Unexploded Ordnance (UXO) Data Standards. Review and incorporate military (including service and DISA DDDS) unexploded ordnance (UXO) related data requirements and standards. Expand the SDSFIE/FMSFIE as required. Prepare "white paper" technical documentation concerning the SDS UXO Data Standards.

j. Component 10 - Update Flora, Fauna, and Cultural Data Standards. Complete the incorporation of remaining flora and fauna related geospatial data standards from previous efforts. Review/evaluate the cultural data model currently being developed for Langley AFB and update the SDSFIE cultural data model as necessary. Prepare "white paper" technical guidance.

k. Component 11 - Update Communications Data Standards. Complete the incorporation of remaining communications related geospatial data standards from previous efforts. Prepare “white paper” technical documentation.

l. Component 12 – Support USAF GeoBase Initiative. The USAF GeoBase Initiative originated in the fall of 1998. The Institute for Information Technology Applications (IITA), US Air Force Academy, has served as the lead office for this effort. The USAF GeoBase Initiative actively promotes the use of the SDSFIE throughout the Air Force.

COST:
FY2001 :

Component 1 -	$ 40K
Component 2 -	40K
Component 3 -	15K
Component 4 -	80K
Component 5 -	40K
Component 6 -	30K
Component 7 -	25K
Component 8 -	25K
Component 9 -	25K
Component 10 -	20K
Component 11 -	20K
Component 12 -	25K
Total	**$385K**

PROJECT #: 96.013
TITLE: Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) – Page 4

PRODUCT:
CD-ROM interactive software products, standards documents, technical reports, digital symbol sets, Internet-based documents and software, training, and additional software and documentation.

CUSTOMERS:
Federal, state, and local government CADD/GIS user community, and their contractors.

REMARKS:
Continued funding over several years needed.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Government Contractors - 100 offices

What is the measurable time or cost savings with the implementation/use of this product?
The SDSFIE can reduce the initial GIS. Schema Development Cost by $250,000 for each typical individual installation GIS implementation. Each installation may have more than one GIS implementation. B/C ratio = 839.9/1 (see ROI report Nov 99)

In addition, the SDSFIE provides the following estimated annual savings per GIS implementation:

a. Data Dictionary Maintenance - $20,000
b. Schema Development Meetings - $17,200
c. Conversions of Contractor Data - $250,000

What, if any, non-quantifiable benefits will be realized?
Use of the SDSFIE provides a nonproprietary format which permits GIS data to be easily shared between agencies. This ability will benefit the Federal government, state government, local government, international, and private organizations.

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

PROJECT #: 96.013
TITLE: Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) – Page 5

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

Are hardware or software upgrades required?
No

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
No

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 96.015

TITLE: Facility Management Standards for Facilities, Infrastructure, and Environment (FMSFIE)

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REQUIREMENT AND OBJECTIVES
Continue development and testing of maintenance, management, and operational related data standards for installation facility management and civil works operations activities. Develop CADD/GIS relational database data content standards for installation facility life-cycle management, and civil works operations and maintenance. The FMSFIE will provide a common data format for maintenance, management, operational, temporal, and event records related to the Spatial Data Standards (SDSFIE) geospatial features and/or the A/E/C CADD Standard objects.

JUSTIFICATION:
The FMSFIE will provide a common data format for the performance of facility management, using CADD/GIS technology, at government installations, commercial/private concerns, and civil works projects, thereby cutting costs and allowing the sharing of data sets among organizations.

APPROACH:
Development and refinement of the FMSFIE will continue for several years (at the pace available funds permit) and to the extent additional requirements are identified.

PROJECT #: 96.015
TITLE: Facility Management Standards for Facilities, Infrastructure, and Environment (FMSFIE) – Page 2

a. Component 1 - FMSFIE Customer Service and Evaluation/Incorporation of Comments. Maintain and update the Center's FMSFIE and "Project" Internet Web Sites. Maintain a database containing FMSFIE comments/questions, and Center replies/resolutions. Review, research, answer comments and questions generated by customers concerning the FMSFIE, and update FMSFIE as necessary to incorporate customer comments and requests.

b. Component 2 - Develop and Update Data Models for Integrated SDSFIE/FMSFIE Release. Perform developmental and final data modeling of the SDSFIE/FMSFIE. Develop "physical" data models (ERWIN and ".PDF" digital formats) for each SDSFIE/FMSFIE release. Develop "physical" data models to evaluate and test A/E/C CADD Standards, SDSFIE, and FMSFIE integration. Begin development of UML Data Models.

c. Component 3 - Develop and Distribute Integrated SDSFIE/FMSFIE Release. Review, update (using "Maintainer"), perform QA/QC testing of FMSFIE aspects of the SDSFIE/FMSFIE database, Browser, Generator, and other SDSFIE/FMSFIE software applications, and distribute one integrated SDSFIE/FMSFIE release. Review and update FMSFIE related "Filters" and technical content. Test FMSFIE components on predominant CADD, GIS, FM, and relational database platforms.

d. Component 4 - Update/Improve SDSFIE/FMSFIE Software Tools. Continued update and improvement of the SDSFIE/FMSFIE software tools (e.g., Browser, Generator, Filter Maker, Translator, and Data Entry) in response to Customer requirements, and to maintain compatibility with COTS software upgrades (e.g., operating system, CADD, GIS, and database). The intent will be to provide "user-friendly" software tools which enhance and facilitate the Customer's use of the SDSFIE/FMSFIE.

e. Component 5 - FMSFIE Related Meetings and Briefings. Attend meetings concerning use of FM software and the FMSFIE. Develop and provide FMSFIE related briefings at the Center, and at various conferences, installations, districts, and meetings (to the extent of available funds). Continued coordination with Federal CAFM initiatives. Host meetings with small groups of technical experts (to the extent available funds permit) for the review and expansion of the FMSFIE technical content.

f. Component 6 - Develop "Asset Management - Facilities" Data Standards. Continue the incorporation of "legal" reporting data requirements for facilities based upon the evaluation and development of correlations between the Navy Facility Assets Data Base (NFADB), Army Integrated Facilities System Mini/Micro (IFS-M), Patuxent River Naval Air Station (PAX) Facilities Management Data Model, Air Force Interim Work Information Management System (IWIMS) and/or ACES, and USACE Financial Management System (CEFMS). Work with PAX, FM, and other FUG's to develop a "physical" (prototype) data model for integration into the FMSFIE. Update and expand the FMSFIE as necessary. Develop implementation and

integration strategies using the PAX FM prototype for propagation throughout the DoD and Federal organizations.

g. Component 7 - Develop "Asset Management - Utilities" Data Standards. Complete the incorporation of Utility Management/Maintenance data standards based upon: (1) The "legal" reporting data requirements related to the repair/maintenance of utilities derived from the NFADB, IFS-M, PAX FM, IWIMS/ACES, and CEFMS; (2) DISA DDDS; (3) input from municipal organizations; and (4) requirements of regulatory agencies (e.g., the EPA).

h. Component 8 - Develop "Asset Management - Real Estate/Parcels" Data Standards. Begin the incorporation of Real Estate and Parcel FM data standards.

i. Component 9 - Develop "Civil Works Operations" FM Data Standards. Begin the incorporation of FM data standards related to USACE Civil Works Operations.

j. Component 10 - Integration of A/E/C CADD Standards, SDSFIE, and FMSFIE. Review and refine the attribute and domain tables developed under the A/E/C CADD Standards project for integration into a common data model with the SDSFIE and FMSFIE.

k. Component 11 - Review and Develop Integration Strategies with Commercial FM Software. Review, evaluate, and develop integration methodology between FMSFIE and COTS FM software. Encourage COTS CADD/GIS/FM vendors to develop commercial applications based upon the SDSFIE and FMSFIE.

COST:

FY2001:

Component 1 -	$ 35K
Component 2 -	$ 35K
Component 3 -	$ 75K
Component 4 -	$ 45K
Component 5 -	$ 30K
Component 6 -	$ 55K
Component 7 -	$ 35K
Component 8 -	$ 25K
Component 9 -	$ 35K
Component 10 -	$ 30K
Component 11 -	$ 25K
TOTAL -	$425K

PROJECT #: 96.015
TITLE: Facility Management Standards for Facilities, Infrastructure, and Environment (FMSFIE) – Page 4

PRODUCT:
CD-ROM interactive software product containing FMSFIE release, Internet-based documents and software, IDEF models, and additional articles and documentation.

CUSTOMERS:
Federal, state, and local government facility and project management personnel, and their contractors; CADD and GIS users; and commercial CADD/GIS software vendors.

REMARKS:
The Facility Management Standards (FMSFIE) is a multi-year effort requiring extended resources and effort. The products and methodology described above represent a phase of the FMSFIE development.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Government Contractors - 100 offices

What is the measurable time or cost savings with the implementation/use of this product?
The FMSFIE can reduce the initial GIS. Schema Development Cost by $250,000 for each typical individual installation GIS implementation. Each installation may have more than one GIS implementation. B/C ratio = 650.25/1 (see ROI report Nov 99)

In addition, the FMSFIE provides the following estimated annual savings per GIS implementation:

a. Data Dictionary Maintenance - $20,000
b. Schema Development Meetings - $17,200
c. Conversions of Contractor Data - $250,000

What, if any, non-quantifiable benefits will be realized?
Use of the SDSFIE provides a nonproprietary format which permits GIS data to be easily shared between agencies. This ability will benefit Federal government, state government, local government, international, and private organizations.

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

PROJECT #: 96.015
TITLE: Facility Management Standards for Facilities, Infrastructure, and Environment (FMSFIE) – Page 5

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

Are hardware or software upgrades required?
No

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
No

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 96.017

TITLE: Maintenance, Revision, and Implementation of A/E/C CADD Standard - (Comp 1, 2, 3, 4)

ORIGINATOR AND SERVICE PROPONENTS:
U.S. Army Engineer Research and Development Center, ATTN: The CADD/GIS Technology Center (Mr. Toby Wilson), 3909 Halls Ferry Road, Vicksburg, MS 39180; (601)634-3604

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FUG Proponent - Stan Shirk, (402)221-4557, stanton.l.shirk@nwo01.usace.army.mil

REQUIREMENT AND OBJECTIVES:
The continued development, evaluation, revision, and implementation of the A/E/C CADD Standards are necessary to meet the needs of field personnel and application software. Integration into a national standard is critical to ensure longevity of effort.

The objectives for FY01 are: (1) Continue development of A/E/C CADD Standards and attributes. (2) Continue implementing standards into software applications (Workspace). (3) Provide input to IAI Object Committee, NIBS Facility Information Council, and CSI to ensure industry interoperability.

JUSTIFICATION:
CADD standards, both presentation and data, offer the single greatest benefit to CADD users by providing easier translations, interoperability between systems and applications, and longevity of data. Development of a standard provides necessary input for a national standard.

APPROACH:
a. Component 1 - Nongraphic Database Development. For FY01, only maintenance on the existing database will be conducted. Changes dictated by the National CADD Committee will also be implemented and will include graphic symbols for attributes not developed in FY00. (Baker developed attribute data for “objects” that we currently have no symbol for (i.e. fire pull station).)

PROJECT #: 96.017
TITLE: Maintenance, Revision, and Implementation of A/E/C CADD Standard – (Comp 1, 2, 3, 4) - Page 2

The major trust for FY01 will be the transition of the nongraphic data to the National CADD Standard and distribution of nongraphic data standards with Release 2.5 of A/E/C CADD Standards CD and Workspace.

b. Component 2 - MicroStation Workspace. Additional enhancements will be incorporated based on input from the Field Group.

c. Component 3 - The FY01 System Manager's and User Training Class CD-ROM will be updated. FY01 will include AutoCAD workspace training.

d. Component 4 – AutoCAD Workspace continue development:

(1) Add drafting automation tools.
(2) Incorporate comments on Beta comments.
(3) Release official Version 1.0

COST: Component 1 - $ 90K
Component 2 - $ 75K
Component 3 - $ 70K (no reproduction costs)
Component 4 - $ 50K
Total = $ 285K

PRODUCTS:
Revised A/E/C Standards Manual/Access Program (Release 2.5), Workspace Implementation Software, and nongraphic attribute database.

CUSTOMERS:
A/E/C community.

REMARKS:
Because of the constantly evolving needs of CADD users and the evolution of software packages, this project requires yearly funding.

Delivery Dates: All components will be released in hardcopy (as required) and electronic formats by October FY01.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 20 installations
Corps - 40 district offices
Navy - 20 installations
Air Force - 20 installations

PROJECT #: 96.017
TITLE: Maintenance, Revision, and Implementation of A/E/C CADD Standard – (Comp 1, 2, 3, 4) - Page 3

What is the measurable time or cost savings with the implementation/use of this product?
Note: Estimates presented here are for 5-year life cycles. Ten, 20- and 30-year life cycles also will be computed by extrapolation.

This project will be operational after 3 years of development
Annually, 300 A/E/C CADD projects
Each A/E/C project includes 100 drawings
CADD Standards applicable to 65% of drawings
Each drawing requires 40 - 60 hours (average 50)
Drafting time reduced by 20%

Labor cost is for GS 9/5 technicians @ $17.38 per hour
Annual saving: 300 projects @ 65 drawings @ 12 hours @ $17.38 = $4,064,580

B/C ratio = 542.62/1 (see ROI report Nov 99)

What, if any, non-quantifiable benefits will be realized?
Long term reusability of drawings in dramatically increased.

Are commercial-of-the-shelf alternative products available?
There are commercial products that have similar functionality, but they are not configured to comply with the A/E/C CADD Standards.

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

Are hardware or software upgrades required?
Not beyond the upgrades that are typical to any office.

Could this product be overtaken by commercial/industry developments within the next two years?
Possibly, if vendors adopt National CADD Standard and implement in their products.

Is there anything similar currently in use?
Nothing based on the A/E/C CADD Standards

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 96.023

TITLE: Generic Details Library Updates and Revisions (Components 1 and 2)

ORIGINATOR AND SERVICE PROPONENTS:
U.S. Army Engineer Research and Development Center, ATTN: The CADD/GIS Technology Center (Mr. Stephen Spangler), 3909 Halls Ferry Road, Vicksburg, MS 39180; (601)634-3104

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REQUIREMENT AND OBJECTIVES:
CADD users within federal agencies have created or are creating hundreds of construction and design details that are not readily available between agencies. Compilation and categorization of these details combined with the software retrieval system developed in the Center's CADD Details Library CD-ROM will greatly enhance the agencies' ability to capitalize on the savings represented in sharing details on CADD systems. FY01 efforts will include reviewing, updating, and revising existing details on both the web site and CD-ROM to reflect user comments in FY00.

JUSTIFICATION:
The reuse of existing construction details among agencies can reduce CADD design/drafting effort per detail sheet from 15 hours to approximately 5 hours or less.

APPROACH:
a. Component 1 - Review existing details to make sure they are up-to-date and relevant based on user comments i.e., the Wednesday discussion forum. If any details need revising, perform the necessary modifications and cleanup required. Update detail reports and make them accessible via the Internet.

b. Component 2 – Create additional metric details. If a sufficient number of details have changed, release a new version of the Details Library on CD-ROM.

COST: Component 1 - $ 25K
Component 2 - $ 25K
TOTAL = $ 50K

PROJECT #: 96.023
TITLE: Generic Details Library Updates and Revisions (Components 1 and 2) - Page 2

PRODUCT:
As a final product for each component, the details and manuals will continue to be distributed in electronic format on CD-ROM as well as being available off of the Internet.

CUSTOMERS:
Architectural, Mechanical, Electrical, HTRW, Structural, Civil/Site, Geotechnical Engineers, Landscape Architects, and Interior Design field personnel.

REMARKS:
This project is anticipated to carry over into future fiscal years due to the constant updates required in a project of this magnitude.

Delivery Dates:
All components will be released on the Internet and/or CD-ROM by September FY01.

FY00 Completed Items:
Updated and maintained CADD Details Library.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 75 installations
Corps - 40 district offices
Navy - 42 installations
Air Force - 60 installations

What is the measurable time or cost savings with the implementation/use of this product?
Assume a site is performing a medium-sized project with approximately 40 details in that project. Assume 50% of those details can be retrieved and adapted from the CADD Details Library (20 details).

Assume it takes a GS-9, step 5, draftsman 3 hrs/detail to draw a detail from scratch. (A GS-9, step 5 makes $36,152/year, which is $17.38/hr. Allowing for overhead: $17.38/hr X 3 = $52.14/hr).

The timesavings for one project would be:
1 project x 20 dtls/proj x 3 hrs/dtl = 60 hours
Therefore, the cost savings for one project would be:
$52.14/hr x 60 hrs = $3128.40/project

Now, assume a site does 10 projects/year. The cost savings/year in using the CADD Details Library would be:
$3128.40/project x 10 projects = $31,284/year

PROJECT #: 96.023
TITLE: Generic Details Library Updates and Revisions (Components 1 and 2) - Page 3

Using the Corps as an example, assume each site performs the same amount of projects. The cost savings/year for the Corps of Engineers would be:
$31,284/year x 40 sites = $1,251,360/year. B/C ratio = 48.83/1 (see ROI report Nov 99)

What, if any, non-quantifiable benefits will be realized?
Generic details can be easily shared between agencies. This ability will benefit agencies far beyond the Army, Navy, Air Force, and Corps of Engineers.

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

Are hardware or software upgrades required?
No

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
AutoCAD's DesignBlocks

INITIATIVE: CUSTOMER

GOAL: INCREASE CENTER'S KNOWLEDGE OF OTHER CADD/GIS INITIATIVES AND RELATED TECHNOLOGIES

PROJECT #: 96.055

TITLE: Support of NIBS Facility Information Council

ORIGINATOR AND SERVICE PROPONENTS:
NAVFAC HQ, Systems Support Division (Code 152), 200 Stovall Street, Alexandria, VA 22332, (703)325-0450

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Center POC - Toby Wilson, (601)634-3604, wilsonj@wes.army.mil

REQUIREMENT AND OBJECTIVES:
The importance of standards in the CADD/GIS environment require that any successful/relevant effort in standardization requires coordination with industry to ensure consistency between and private and commercial industry.

The objective is to ensure that the interests of the various elements of the CADD/GIS user community are fully represented in commercial and industry (both national and international) standards activities.

JUSTIFICATION:
This national effort significantly reduces the responsibility and resources required by the Center to develop, maintain, and promote the use of CADD standards. National/International standards will also reduce the cost of facility design and construction by promoting the use of CADD and CADD standards.

APPROACH:
The Center will coordinate and fund participation from the field users and staff members to attend the NIBS Facility Information Council meetings. Participate in quarterly meetings, to provide our standards for review and acceptance by NIBS Facility Information Council, to support international travel for participation in ISO and related standards development activities, to support, with BOD and Corporate Staff approval, funding requests for support of NIBS Facility Information Council.

PROJECT #: 96.055
TITLE: Support of NIBS Facility Information Council - Page 2

COST:
$25,000
International travel for ISO is funded from this project.

PRODUCT:
Trip reports and coordination with industry regarding the A/E/C Standards effort.

CUSTOMER:
Federal, private, and commercial users.

REMARKS:
Delivery Dates: None. This is an ongoing yearly requirement.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
None required.

INITIATIVE: INTERNAL PROCESS

GOAL: MARKET THE CENTER TO INCREASE THE FIELD'S KNOWLEDGE OF THE CENTER'S PRODUCTS AND SUCCESSES

PROJECT #: 96.150

TITLE: Marketing

ORIGINATOR AND SERVICE PROPONENTS:
U.S. Army Engineer Research and Development Center, ATTN: The CADD/GIS Technology Center (Mr. David H. Horner), 3909 Halls Ferry Road, Vicksburg, MS 39180; (601) 634-3106

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REQUIREMENTS AND OBJECTIVES:
Promote CADD/GIS technology through brochures, technical papers/publications, conferences, and meetings of professional organizations, and in academia. Disseminate information that demonstrates the proper applications of CADD/GIS and the benefits of implementing CADD/GIS in the performance of the Center's mission.

JUSTIFICATION:
CADD and GIS are highly technical tools with great benefits to the Federal Government. In order to maximize the advantages of these tools the Center must be aware of different ways to apply CADD/GIS to accomplish our mission. The Center's promotion of the technology is critical to educating the public about the benefits of CADD/GIS.

APPROACH:
Center personnel will give presentations and demonstrations at symposiums, conferences, meetings of professional organizations, and in academia. Such participation will ensure that CADD/GIS users remain abreast of CADD/GIS technology and Center initiatives. Also, e-mail and server applications will be instituted to send new information to Field Members when products are ready to be publicized and sent out. This will give beforehand knowledge of impending products from the Center. Also, sending information to other public groups/news agencies for the express task of sending out specific press releases and information in their publications of impending product releases from the Center. This will keep everyone aware.

PROJECT #: 96.150
TITLE: Marketing - Page 2

COST:
$30,000

The Center also will maintain a 20ft X 20ft modular booth for marketing the Center at shows/exhibits.

PRODUCT:
Direct marketing of Center products to other federal, state and local governments. Supports Federal Government services on an as requested basis, i.e. Air Force Integrated Process/Products Team. Also, supports National Government and Industry. The need for a separate list Server has been overcome through Microsoft Outlook Mail. The addressing of SMTP(Web based Mail) is currently the preferred method of e-mail. Software updates to Microsoft Outlook Mail and Microsoft Product base are required to maintain lists. There is also time and requirements for solicitation to industry for the technological improvements and enhancements to the Standards. The Center will then send out information to Major Publications in order to solicit industry and other Governmental Agencies for input and further marketing.

CUSTOMERS:
Federal agencies, public agencies, academia, industry standard organizations, and the general public.

REMARKS:
Continuing activity from FY00.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
None required.

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 96.200

TITLE: Support of BOD, Corporate Staff, and FUG

ORIGINATOR AND SERVICE PROPONENTS:
U.S. Army Engineer Research and Development Center, ATTN: The CADD/GIS Technology Center (Mr. David Horner), 3909 Halls Ferry Road, Vicksburg, MS 39180; (601) 634-3106, Fax (601) 634-4584), e-mail: hornerd3@wes.army.mil

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Center POC - David H. Horner, (601)634-3106, hornerd3@wes.army.mil

REQUIREMENTS AND OBJECTIVES:
The Center is responsible for organizing and coordinating the activities and meetings of 8 selected FUGs: Construction/Design, Environmental, Facility Management, Military Planning, Civil Works, and Natural Cultural Resources. Meetings are held 2 times a year and require Center staff to: (a) issue travel and per diem MIPRS for the members, (b) edit, publish, and distribute Meeting Minutes and Lessons Learned in both hard copy and electronic (i.e. Mosaic) format, (c) initiate and track budgets for the FUGs and the FUGs' related projects, (d) coordinate chairmen and member selection, and (e) maintain member POC database. Address FUG membership needs. Distribute meeting minutes for each group, publish lessons learned, etc.

Center goals for FY00 FUG support include:

a. A more defined/standardized agenda format for meetings that identify and document user requirements and training needs.

b. Identify and maintain data requirements and data flow for typical projects.

c. Identify hardware/software needs of the field user and document user implementation issues.

d. Organize regular CAD2 software demonstrations.

PROJECT #: 96.200
TITLE: Support of BOD, Corporate Staff, and FUG - Page 2

The Center staff is also responsible for administering special FUG activities/projects that require additional meetings and funding. These activities include projects initiated by the Center & the Corporate Staff (i.e., discipline-related standards review).

The Center is responsible for supporting information and presentations to the BOD and the Corporate Staff. This support involves funding travel to members to attend meetings, as allowed by law and regulations, to prepare documents, and to provide individual group members with information at their requests. All work performed by the Center for the BOD and the Corporate Staff is included in this project. There are approximately 16 meetings to be held during FY00.

JUSTIFICATION:
These FUGs will address concerns and pursue potential solutions to issues and problems identified by the BOD, the Corporate Staff, and the Center or by the FUG membership.

APPROACH:
Provide travel and per diem funding for 4-6 BOD and Corporate Staff meetings and 2 FUG meetings per group annually. Fund Center facilitators to organize and conduct meetings.

COST:
$300,000

PRODUCT:
Meeting minutes for each group and related project documents (i.e. standards, guidelines, user manuals, Mosaic documents, etc.)

CUSTOMERS:

REMARKS:
Continuing activity from FY00.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
None required

INITIATIVE: INTERNAL PROCESS

GOAL: MARKET THE CENTER TO INCREASE THE FIELD'S KNOWLEDGE OF THE CENTER'S PRODUCTS AND SUCCESSES

PROJECT #: 96.210

TITLE: Equipment (Maintenance Support)

ORIGINATOR:
U.S. Army Engineer Research and Development Center, ATTN: CADD/GIS Technology Center (Mr. Milton Richardson), 3909 Halls Ferry Road, Vicksburg, MS 39180; (601)634-4580

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REQUIREMENT AND OBJECTIVES:
The CADD/GIS Technology Center maintains numerous computer workstations, printers, servers, scanners, networking equipment and PCs as part of its mini-lab facility. Equipment upgrades, system replacements.

JUSTIFICATION:
Equipment must be maintained and upgraded to meet changing technology and software requirements and to assess commercial software and hardware and custom written utilities being used by the sites supported by the CADD/GIS Center. The mini-lab is also used as a workshop facility and a "State-of-the-Art" demonstration area for hardware and software used by and recommended to CADD/GIS sites. Many of the existing machines in the mini-lab have been removed this year due to the age and their limited hardware resources. These machines need to be replaced with workstations capable of running the latest operating systems; currently there are only three existing machines that meet these criteria. Many Center projects (such as software for standards implementation, standard details programs, etc.) require CADD/GIS platforms for validation. Existing UNIX and older Intel based machines are past their life expectancy and will need to be replaced with new technology superior hardware. If current and future software/hardware is not maintained with maintenance contracts, new purchases, which will be much more costly than maintenance, will be required to bring these up to current versions. Without the latest in hardware and software technology the Center cannot perform it's required functions and mission.

APPROACH:
Maintain maintenance contracts & upgrade existing equipment as necessary.

PROJECT #: 96.210
TITLE: Equipment (Maintenance Support) - Page 2

COST:

Maintenance:	
Bentley CSP	$ 7,700.00
Intergraph Maintenance	$ 53,000.00
ESRI Maintenance	$ 7,500.00
Microsoft Maintenance	$ 2,200.00
Tracor Maintenance	$ 2,500.00
Misc. Maintenance	$ 2,500.00
SUBTOTAL	**$ 74,800.00**
Labor:	
Government	$ 87,856.00
Contract	$ 97,860.00
SUBTOTAL	**$185,725.00**
New Hardware:	
Hardware Replacements	$ 25,000.00
SUBTOTAL	**$ 25,000.00**
New Software:	
CADD/GIS Software	$ 7,000.00
SUBTOTAL	**$ 7,000.00**
TOTAL COST	**$293,125.00**

CUSTOMERS:
Center and Center Partners.

REMARKS:
None

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Not required.

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 98.005

TITLE: Standard Data Format for Geotechnical and Geological Exploration - Phase III

ORIGINATOR AND SERVICE PROPONENTS:
USACE, St. Louis District, ATTN: Mr. Patrick Conroy (CEMVS-ED-GF), 1222 Spruce Street, St. Louis, MO 63103-2833, Phone: (314)331-8432, Fax: (314)331-8244; patrick.j.conroy@mvs02.usace.army.mil

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REQUIREMENT AND OBJECTIVES:
Allow data exchange between geotechnical/geological engineers for Center-affiliated agencies.

The objectives are:

1. Develop database structure for lab analysis and reporting requirements for geotechnical boring logs that will support the life cycle projects at Districts, military installations, and other Federal agencies.
2. Evaluate any new non-proprietary applications to support archiving of boring log forms, lab analysis graphs, and engineering report tables.
3. Interface with the geotechnical software industry through the Working Group for Geotechnical Standard Protocols (GML group).

JUSTIFICATION:
A standard data format for the results of geotechnical/geological exploration will allow interchange of this info between the drillers, testing laboratories and engineers within a given agency. The data could also be shared among other the Center-affiliated agencies, Government contractors and private companies. A standard data format would allow this data to be easily shared across a local Intranet or worldwide, via the Internet. The driller in the field could record boring data and the lab technician in real time could enter lab-testing results. When completed, the engineer or technician could quickly retrieve the data to his/her computer screen. Utilizing document imaging tools, geotechnical investigations and project reports will be streamlined resulting in time and cost savings.

APPROACH:
1. Obtain lab analysis forms and engineering reports from Districts and other related agencies.

PROJECT #: 98.005
TITLE: Standard Data Format for Geotechnical and Geological Exploration - Page 2

2. Develop standards to support the lab analysis and final engineering reports (i.e. general design memorandums). Evaluate existing capability of available log data software and Commercial-Off-the-Shelf products.
3. Identify archiving and storage tools for geotechnical investigations.
4. Test at a minimum of 2 archiving software packages against a standard set of criteria including viewing and analysis capabilities; support for standard log templates; metadata; data fields and manipulation; printing and plotting options; and graphic presentation.
5. Coordinate standard protocols to the Working Group for Geotechnical Standard Protocols (GML group).

COST: $70,000.00

PRODUCT:
1. Interactive application presenting database schema for lab analysis and engineering reports for boring logs.
2. Evaluation results of available COTS products posted on Web site.
3. Identify available applications to support archiving and storage of boring logs.

CUSTOMERS:
Corps of Engineers, Air Force, Navy, Army, and Coast Guard. Other Federal Agencies: USGS, EPA, and USDA. Others: Government contractors, Private engineering firms, and Private exploration and testing firms.

REMARKS:
This is 3rd year of a 5-year investigation. A detailed report was completed in FY98 describing how geotechnical/geological boring and sampling data are now being collected and recorded. The FY00 efforts have focused on evaluation of existing software to meet the diverse geotechnical needs. The next year would concentrate on developing standard database format to support software implementation. The next phase would address the archiving and storage of large geotechnical forms.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Other agencies -29 offices

What is the measurable time or cost savings with the implementation/use of this product?
The standardized digital data format and implementation of standardized software produced by this project can save 500-1,000 hours per year per office for a GS- to GS-12. Assuming 50 geotechnical offices, annual savings due to this project are $2,150,000 and 10 national

laboratories, the annual savings are $801,500. Estimated total discounted 5-year life cycle benefits, based on the return on investment analysis, are $8.0 Million. B/C ratio = 106.7/1

What, if any, non-quantifiable benefits will be realized?
None

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

Are hardware or software upgrades required?
Yes

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
No

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 98.045

TITLE: Continued Development of a Data/Project Management System for Survey Engineering

ORIGINATOR AND SERVICE PROPONENTS:

USACE, Memphis District, Michael Watson, 167 North Main, RM B202, Memphis, TN 38103-1894; Phone: (901)544-3898; Fax: (901)544-3082; mike.s.watson@usace.army.mil

U.S. Army Engineer Research and Development Center, Dr. V. Danushkodi, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199; Phone: (601)634-4452; Fax: (601)634-4584; danushv@wes.army.mil

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REQUIREMENT AND OBJECTIVES:

Offices acquiring, developing, managing, and distributing geospatial data are in desperate need of software utilities and a standard database schema to provide automated management and distribution of geospatial data internally on their Intranet and externally on the Internet. At increasing numbers the private, commercial, and governmental sectors are requesting Government produced data sets. The Spatial Data Standard for facilities, infrastructure, and environment (SDSFIE) has been developed to provide standards for GIS corporate data schema.

Through the combined efforts of the Topographic Engineering Center and The CADD/GIS Technology Center, during FY97 through FY99, a utility is being developed to promote the management of survey control. Further enhancements are required to match SEMMS tables with SDSFIE, maintain NGS data sheets, and serve the SEMMS database to the public through Internet. Also due to current trends of downsizing Government personnel forces, the task of managing and disseminating geospatial data must become more automated. The requirement to develop standard procedures and measures has increased due to the increased volume of data and the worldwide Internet distribution network. The necessity to standardize quality control procedures, data management, cataloging, storage, and retrieval is required by all organizations. The implementation of SDSFIE for surveying and mapping projects combined with a

standardized data/project management system will significantly improve productivity and serve to implement E.O. 12906.

In FY2000, the SEMMS database and software application were updated to match the SDSFIE; SEMMS Web development continued using Tiger Mapping Service and other commercial software products (e.g., ArcView Internet Map Server and GeoMedia Web Map); and the NGS compressed data files were updated.

JUSTIFICATION:
Reference EC 1130-2-206, EO 12906. Automation systems for spatial data acquisition and analysis are increasingly necessary due to workforce reductions. However, the use of these systems combined with Intranet and Internet dissemination processes and referenced policies dictate the necessity to implement SDSFIE within a framework of standard methodology to manage produced data more effectively. The costs of data acquisition and data liability issues within the public and private sectors also dictate that acquired data be made available in an accurate, efficient, and timely manner.

APPROACH:
Based on field user input, additional tools will be developed to support existing survey monument management application. After contacting the appropriate POCs, program applets will be written to enhance existing menus and help files for SEMMS.

Task 1. Phone survey of District to better define existing paper storage methods.
Task 2. Develop data entry tools.
Task 3. Prepare document describing typical conversion process.
Task 4. Produce and distribute CDs.

COST:
Task 1 ….. $ 3,000
Task 2 ….. $35,000
Task 3 ….. $ 9,000
Task 4 ….. $ 1,000
Total ..… $48,000

PRODUCT:
The final product will be enhanced SEMMS software, a user's manual, updated NGS data, and web based SEMMSWEB to serve the database to the public. The product will be available for downloading from The CADD/GIS Technology Center's Internet web page and CDs will be distributed to District offices and Installations.

PROJECT #: 98.045
TITLE: Continued Development of a Data/Project Management System for Survey Engineering – Page 3

CUSTOMERS:
Includes all agency personnel, their contractors, and the general public performing and/or requiring surveying engineering information.

REMARKS:
This should be understood as a continuation of FY99-2000 Project.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 75 installations
Corps - 41 district offices
Navy - 42 installations
Air Force - 60 installations

What is the measurable time or cost savings with the implementation/use of this product?
The software produced by this project, SEMMS, can save 384 hours per year per office for a GS 7 Step 5 engineer at $51 per hour. Assuming 41 USACE Districts and 100 Military Installations, annual savings due to this project is $2,760,000. B/C ratio = 55.2/1.

What, if any, non-quantifiable benefits will be realized?
None

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
A training course will be developed as a part of this project and offered as a PROSPECT course.

Are hardware or software upgrades required?
No

Could this product be overtaken by commercial/industry developments within the next two years?
No
Is there anything similar currently in use?
No

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 98.125

TITLE: Integration of CADD and GIS Standards and Digital Data

ORIGINATOR:
U.S. Army Engineer Research and Development Center, ATTN: The CADD/GIS Technology Center (Ms. Denise Martin), 3909 Halls Ferry Road, Vicksburg, MS 39180; Phone: (601)634-4574, Fax: (601)634-4584; martind1@wes.army.mil

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REQUIREMENT AND OBJECTIVES:
Over the past 3 years, this phased project has accomplished the following:

1) performed and documented a detailed comparison of A/E/C CADD Standards and Spatial Data Standard for facilities, infrastructure, and environment (SDSFIE);

2) developed a Visual Basic application to correlate each A/E/C CADD Standard feature to its appropriate SDSFIE feature.

Currently, procedures and tools are being developed to permit A/E/C CADD standard-compliant CADD drawings/details and construction information, to be directly integrated into a SDSFIE-compliant database schema.

As the A/E/C CADD Standard and SDSFIE evolve, the databases, cell libraries, and symbologies associated with the integration tools developed within this project must be synergistically maintained. Therefore, the objective of this project is to synergistically maintain the databases, cell libraries, and symbologies associated with the A/E/C CADD Standard and SDSFIE/FMSFIE.

NOTE: This is the final year for this as a separate project. It will be discontinued in FY02.

JUSTIFICATION:
This project will benefit all installation facility management and civil works operations and maintenance activities in the cost-effective integration of CADD based maps and design drawings with GIS based technology.

PROJECT #: 98.125
TITLE: Integration of CADD and GIS Standards and Digital Data - Page 2

APPROACH:
Perform periodic (quarterly) correlation analyses between the A/E/C CADD Standard and the SDSFIE cell libraries, attribute/domain tables, and symbologies.

Coordinate with the A/E/C CADD Standard developers and the SDSFIE developers to ensure that new elements (objects/features) that are common to both standards are modeled equivalently and that changes to common elements are performed synchronously.

COST:
FY2001: $35,000

PRODUCT:
Synergistically maintained cell libraries, symbologies, and databases

CUSTOMERS:
Federal, state, & local government CADD/GIS users, facility/project managers, and their contractors; and commercial CADD/GIS software vendors.

REMARKS:
This project is a continuation of a 3-year project which began in FY98. It is necessary to maintain the currency of the data which drives the tools developed.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 75 installations
Corps - 41 district offices
Navy - 42 installations
Air Force - 60 installations

What is the measurable time or cost savings with the implementation/use of this product?
The software produced by this project can save 500-1,040 hours per year per office for a GS 7 Step 5 engineer at $51 per hour. Assuming 200 Military Installations, annual savings due to this project is $7,854,000. Estimated total discounted 5-year life cycle benefits, based on the return on investments analysis, are $14,000,000. B/C ratio = 400/1

What, if any, non-quantifiable benefits will be realized?
None

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

PROJECT #: 98.125
TITLE: Integration of CADD and GIS Standards and Digital Data - Page 3

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

Are hardware or software upgrades required?
No

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
No

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 98.190

TITLE: Continued Support of Electronic Bid Solicitation (EBS) Project and Implement Web-based Bid Submittals

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES
The Corps of Engineers (HQUSACE) and the Naval Facilities Engineering Command (NAVFAC) Headquarters have mandated the use of Electronic Bid Solicitations (EBS) throughout their installations. The Air Force Center for Environmental Excellence (AFCEE) and the Army National Guard (ARNG) have also adopted the EBS process. In the private sector, the process has been used by Anheuser Busch.

The objectives of this project are to save money in printing costs and improving the procurement process. Millions of dollars are spent each year in printing paper solicitations. The EBS process can reduce the printing costs by as much as 80%. EBS also streamlines the procurement process by standardizing the way solicitations are distributed and returned by bidders to the government.

JUSTIFICATION:
EBS consists of a standard process and procedure to replace printed solicitations with an electronic set. The use of EBS results in improving and streamlining the procurement process, eliminating unnecessary reproduction and storage of printed media, and allowing significant savings in resources. Solicitation documents are also available on the Internet.

PROJECT #: 98.190
TITLE: Continued Support of Electronic Bid Solicitation (EBS) Project and Implement Web-based Bid Submittals – Page 2

APPROACH:
(1) Continue the support and development of EBS. As technology improves and new requirements are identified, the EBS process must be kept up to date. Dynamic HTML (DTTML) will be used to improve the functionality of some of the pages.

(2) Implement Army Single Face to Industry (ASFI) and One Door to the Corps requirements. The Army has mandated that all Corps solicitations be posted to their ASFI web site. We will develop and maintain the necessary software to meet this requirement. We will also develop a central listing of all Corps solicitations to meet the One Door to the Corps policy. As part of these requirements, solicitation data will be available in XML.

(3) Implement Regional Business Center requirements. The Corps is in the process of creating regional centers to post EBS solicitations. These Centers will host solicitations from multiple districts at a single location. The current web application was designed for individual districts. We will modify the application to support multiple districts at one location. We will look at what NAVFAC has done with their central web site and adopt their model if it is appropriate.

Component 1 – Continue Support and Development	$40,000
Component 2 – ASFI, One Door to the Corps, XML	$50,000
Component 3 – Regional Business Centers	$75,000

COST:
$165,000

PRODUCT:
Maintain state of the art, implement ASFI and Regional Business Center requirements. Continue to provide support to installations.

CUSTOMERS:
Contracting community.

REMARKS:
This project is the continuation of FY2000 Project 98.190. Adoption of the EBS process by the Army National Guard could potentially add more than one hundred new users. Components 2 and 3 will mostly apply to the Corps and Army sites. However, we currently have 50 participating agencies listed on our web site and 42 of those are Corps or Army.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
<u>Once completed and fielded, how many offices will use the results of this project?</u>
Corps - 40 Districts
Navy - 42 Installations
Air Force - 60 Installations

PROJECT #: 98.190
TITLE: Continued Support of Electronic Bid Solicitation (EBS) Project and Implement Web-based Bid Submittals – Page 3

Army – 50 Installations

What is the measurable time or cost savings with the implementation/use of this product?
Assumptions:
Based on several projects that have used EBS to date (approximately 100 projects), the typical savings is about 80% versus issuing bid solicitations on paper.

If a typical bid solicitation using paper requires 200 sets of drawings to be printed and costs $150 per set, the cost is: (200)($150) = $30,000 for a paper solicitation

The same solicitation on CD-ROM (Electronic) would cost:
(0.20)($30,000) = $6,000

A savings of $24,000

If EBS is used on 300 projects annually, the savings could be:
(300)($24,00) = $7,200,000. B/C ratio = 45/1 (see ROI report Nov 99)

What, if any, non-quantifiable benefits will be realized?
Bid Solicitations will be easier to archive.

Are commercial-of-the-shelf alternative products available?
Yes

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

Are hardware or software upgrades required?
Yes

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
No

INITIATIVE: AEC OBJECT STANDARDS

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 98.245

TITLE: AEC Object Standards

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
This project will continue the Center's active role in the development of A/E/C standard objects through collaboration with industry, government, and academia using the organization of the International Alliance for Interoperability (IAI). In FY01, the project will complete work on standard objects for IFC Release 2.X and continue work on objects for IFC Release 3.0.

JUSTIFICATION:
The Center is an active participant in the development of A/E/C Object Standards through the International Alliance for Interoperability (IAI). The Center currently supports leadership in the IAI through the chairs of the Facilities Management Domain and the Project Management Domain. The Center will support the senior technical manager of the North America Chapter to insure a consistent approach and a government presence in the IAI leadership.

APPROACH:
The project will be accomplished through continued membership in the IAI, periodic meetings of the domain groups, and continued interaction with the model and object designers. The Center's representatives will facilitate and participate in IAI meetings that control development of A/E/C Objects. The center will partner with the more than 600 organizations of the IAI. The Project management and Facilities management domain groups will develop object models that will be delivered as releases. Contents on the releases are managed by the technical personnel of the IAI. The software vendors will incorporate these releases into their commercially available products. Currently, over 50 software vendors of CADD and related software (including Bentley, Autodesk, Grafisoft, Timberline, Primavera, Visio, and Archabus) have committed to using IAI objects in their software packages.

PROJECT #: 98.245
TITLE: AEC Object Standards – Page 2

COST:
FY01: $105,000
FY02: $110,000
FY03: $110,000

The cost will support the IAI fees for the Center and about 70% of a person with associated travel and per deim.

Other members of the IAI contribute 100% of their cost to participate in the effort.

PRODUCT:
The project will produce PM and FM components of Release 2.X standard object library and minimal models for Release 3.0.

CUSTOMERS:
The Release 2.X object labrary will be used initially by software vendors. As they incorporate the library into their products, users will be those who purchase and use the software. Having standard objects in COTS software makes it difficult to precisely quantify users.

The standard object library will be in CADD, PM, FM, and other types of software.

REMARKS:
None.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices
Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

What is the measurable time or cost savings with the implementation/use of this product?
The standard objects developed to date have been shown to completly interoperate with no errors and dramaticlly reduce data conversion time between COTS software.

Assume 1,000,000 data conversions are performed per year by people that cost and average of $25 per hour. Assume that each data conversion, including verification, takes 1 hour when not using standard objects. We have seen that data conversions with standard objects take less than 5 minutes and produce no degredation in data content or quality. Therefore, the cost of the new technique would be at most 10% of the status quo cost or 1,000,000 * 25 * 10% $2,500,000. The cost savings will be at least $22,500,000. B/C ratio = 214/1 (year 1)

PROJECT #: 98.245
TITLE: AEC Object Standards – Page 3

What, if any, non-quantifiable benefits will be realized?
Standard objects will improve data quality of all supporting products.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
COTS software supporting Release 1.5

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 99.021

TITLE: Awareness Seminars

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENTS AND OBJECTIVES:
This project creates a partnership among the Center, Individual Services, Federal agencies, Government Agencies, Academia, and Industry. The project will demonstrate to leaders and resource managers how to promote and utilize facility information management tools. Specifically, the project supports the following: DOD policy guidance and its focus on the National Defense Strategy, Joint Vision 2010 (JV2010), the Quadrennial Defense Review (QDR), the Cohen Defense Reform Initiative (DRI) and the National Defense Panel review. To accomplish this, all aspects of information management must be considered and mastered. This project is essential to ensuring that information superiority is achieved at the facility level in order to support the focused logistics required to organize, fund, staff, educate, equip, train, mobilize, deploy and sustain our war fighters.

Provide education and training on the importance of spatially based information at the facility and installation level, and the leveraging of technology tools to manage and plan the use of Federal Government resources necessary for real time support of National Security objectives.

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TITLE: Awareness Seminars – Page 2

Elevate and promote this awareness throughout the chain of command. Whatever is implemented at the installation/base level must be supportable up the chain.

Provide access to and add credibility with senior leaders and resource, business and program managers in order to accomplish this objective.

Leverage Government resources through partnering with the services, academia, and the private sector.

Increase the perceived value and use of shared information developed with spatially based commercial-off-the shelf information tools at the installation at the beginning of the power projection planning cycle.

Promote joint-ness by providing the basis for a common data management strategy and implementation approach.

Provide the basis for a consortium for dual-use development in circumstances where COTS solutions do not exist.

APPROACH:
Develop a portable and distance learning instructional course on the why and how of implementing facilities life-cycle management practices at the base/installation level. One of the primary how to objectives will be the development of an implementation plan at an activity, and the strategy for convincing the leaders and members of that organization and their superiors that spatially based information management tools are essential to achieving installation life cycle management and power projection. This will be accomplished in three phases:

Phase I –Completed FY99
Course Background Development, Development of Course Presentation Materials, Course Notebook, Course CD-ROM, and Implementation Guide. The course will consist of eight (8) modules that could be presented in as few as two calendar days. Each module will comprise 1-1/2 to 2 hours of instruction, depending on presentation style. *An executive level awareness course will be distilled from this material to ensure that leaders and resource, business and program managers are, in fact, exposed to and understand the essential importance of these Tools and the definitive success factors that they offer.* Each instructional module will contain the following:

- Instructional slide set
- Detailed lecture notes
- Reading materials and reference materials

CD-ROM with all lecture and reading materials

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The specific objectives of the course are to:

Deliver a polished, consistent message with appropriate audiovisual support and Reference materials about the broad benefits of installation / facilities life cycle Management, with detailed information about tangible benefits vs. tangible costs for individual sites. Provide attendees with a guide to support them in implementation

Phase II-Completed FY 2000 $ 50,000 – Center funded
$185,000 – Navy funded

Instructional Web site and Interactive CD-ROM. Phase II consists of developing an interactive CD-ROM that will complement the course materials. The contents of the CD-ROM will also be accessible via a link in the Web site. The CD-ROM and web site will contain instructional materials with links that will allow a user to move from written material to graphics to video clips, etc. It will also contain vendor information and links to vendor Web sites. The Web site will be dynamic, easily updateable and changeable for the purpose of being responsive to new developments in the course presentation philosophy.

Phase III-Projected first quarter FY 2001
Dry Run, Train the Trainers Sessions, and Road Show tailored to each services terminology and business practice.

COST:
$120,000

PRODUCT:
Curriculum and instructional materials for a two-three day seminar on cost-effective implementation of life-cycle management practices.

CUSTOMERS:
CINCS, Service Headquarters, Major Commands (Claimants) and Installation Commanders throughout the chain of command
OASD and the Joint Staff
Installation Tenant Activities
Logistics Activities

REMARKS:
This is a partnering project with multiple Federal Government proponents and participants.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army 150 Installations
Navy 150 Installations (includes Marine Corps)
Air Force 150 Installations

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What is the measurable time or cost savings with the implementation/use of this product?
Based upon Navy implementation alone, it has been determined that non-recurring cost has averaged $2.0M 1997 dollars per typical base with 1,000 or more personnel. This includes hardware and software acquisition and installation, initial process re-engineering and all database integration efforts. Typical saving in the form or real year-to-year operating budget reductions of $1M to $5M are being reported by the first four implementing bases. The four bases are the Naval Construction Battalion Center, Port Hueneme, California; the Naval Air Warfare Center, Patuxent River, Maryland; the Naval Surface Warfare Center, Dahlgren, Virginia; and the Navy Public Works Center, Washington, DC.

What, if any, non-quantifiable benefits will be realized?
The following statements are representative examples from the four installations/bases identified above: The benefits were realized almost immediately. It's a quicker, more efficient way of doing business. It gives us the tools to be more responsive to the needs of our tenants. By implementing the improved technology and streamlining operations, we accomplish 100% more work than before. We can now produce an Emergency Services Status Report in as much time as it takes the printer to print it. The Family Housing Dependents Report used to take ten minutes to run, and totals had to be summed by hand. Now the report can be run in 30 seconds with all totals. Family housing is tracking more information, thereby giving them the resources for providing better customer support. Any organization, facility, system or asset can be consolidated and reported, however, the largest benefit is yet to be realized. With this new way of doing business, employees have the ability to perform data comparisons and trend analyses, giving them the tools to make better decisions and predict system behavior. Life-cycle information management has made my job easier. It's brought information to one place so that I can access it quicker, so people in the Public Works Department (Base Civil Engineer) can access information quicker---it's helped us improve customer service.

Life-cycle information management has allowed us, through the shop efforts in Public Works (Base Civil Engineer), to get more work accomplished with the same amount of people. Using bar coding and handheld scanners, we're able to download automatically to the computer versus writing reports. This has freed up about 12% of their time to do more work. Because everybody has access to share information at the same time, life-cycle information management raises the level of consciousness. And because you have a raised level of Consciousness focused on holding down costs; we've been able to save----a grand total of $5 million in just the overhead account. What we're trying to do is develop a common database that will allow us over time to have single entry of information and ultimately it will be able to be rolled up all the way to the higher headquarters level. This will provide them with the information they need without making extra entries or providing special reports...it can all be done electronically and that is important to our future. We try to match the customers requirements to the asset we have (here)...life-cycle information management is very helpful because it allows me to go into the system that is accurate and download information that normally would take us days to get.

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TITLE: Awareness Seminars - Page 5

Are commercial-off-the-shelf (COTS) products available?
Yes. The implementation philosophy provided by this product centers around COTS applications

Does the project conform to current technology?
Yes. The whole point of this awareness training is to help those leaders and resource, business and program mangers make the right decisions when expending scarce resources.

Does the project identify well-defined stages of development with clear completion points?
Yes. The success of these spatially based initiatives is of paramount importance. People and process issues will make or break any implementation. This awareness training will provide special emphasis on how to achieve successful technology implementations.

Is training required for the project?
The project provides training, project implementation and technology awareness tools.

Are hardware and software needed for this project?
No. This project will train attendees on how to select the best, most cost effective hardware and software tools for the required job.

Could this product be overtaken by commercial/industry developments within the next two years?
No. Absolutely not. This project will prepare government personnel to keep up with and make current and accurate technology decisions.

Is there anything similar currently in use?
No. This training will provide best of best training in how to get the biggest bang for the smallest expenditure of scarce resource dollars.

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 99.030

TITLE: Library of CADD Designs

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
The existing Library needs to be maintained to continue being an effective tool for all designers. New project submittals need to be indexed and uploaded to the system as they become available. The objective is to continue maintenance of the library and add applications (Designs) to the library.

JUSTIFICATION:
The purpose of the library is to make CADD drawings of completed project designs available to designers. Designers can review designs on-line for specific features and downloaded for use in the preparation of new designs. These Standard or non-standard designs will give a starting point to the designer to jump-start the design process. For those designs for which there is a Standard Design, the Library provides links to the Centers of Standardization. Adaptations of Standard designs will be added to the Library as they become available. The Library will provide multiple solutions to similar projects for the designer to review prior to initiating his/her design.

APPROACH:
Continue to add new projects; index and load on server.

COSTS:

Labor:		
Library Maintenance		$30,000
	Total	$30,000

PROJECT #: 99.030
TITLE: Library of CADD Designs - Page 2

PRODUCT:
A useful web-based Library of CAD Designs

CUSTOMERS:
DPW's
BCE's
USACE Districts
Navy Design Agents
A-E Firms with federal contracts

REMARKS:
None

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army-Yes
Corps-Yes
Navy-Maybe
Air Force-Yes

What is the measurable time or cost savings with the implementation/use of this product?
Time savings: Assume time saved in locating Standard Design (if required) is 8 hours
Time saved in getting design started & drafting savings additional 48 hours
Total Time savings is 56 hours per project
USACE MCA Program for FY99 is 34 projects - Assume 1/2 could use Library - 17 projects
Time saved USACE only = 952 hours

Cost Savings: GS11, Step 5 w/ overhead = $65 / hour
$65 x 952 = $61,880
Similar savings from Navy
Total savings per year = $85,640
B/C ratio = 62.85/1

What, if any, non-quantifiable benefits will be realized?
This product should enable design time for projects to be reduced substantially, with projects completed ahead of schedule.

Are commercial-off-the-shelf alternative products available?
No.

Does the project conform to current technology?
Yes

PROJECT #: 99.030
TITLE: Library of CADD Designs - Page 3

Does the project identify well-defined stages of development with clear completion points?
Yes.

Is training required for the product? If so, how many people per agency?
No.

Are hardware or software upgrades required? If so, at what cost per workstation and/or user?
Yes

Could this product be overtaken by commercial/industry developments within the next two years?
No.

Is there anything similar currently in use?
No

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 99.035

TITLE: Balanced Scorecard

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
The Center is responsible for organizing and maintaining the projects for each Fiscal Year. In order to continue development of the performance metrics that are linked to the Center's mission and the strategic plan, the current and future projects are to be graded and measured against this development. The objectives and goals are listed below:

Center Involvement for the Balanced Scorecard:

a. Continued refinement of the strategic performance measures (metrics) for The CADD/GIS Center based upon the Balanced Scorecard approach with linkage to the Center's Strategic plan.

b. Identify and develop the metrics to support the projects for FY01 and refine the strategic objectives for these projects.

c. Identify any new performance objectives and show the linkages to the Strategic Plan.

JUSTIFICATION:
This project will facilitate the process by which the Corporate Staff addresses the concerns and recommends the potential solution for FY01 projects through the Balanced Scorecard approach.

APPROACH:
1. Refine and/or develop strategic performance measures.
2. Develop, track, and maintain the metrics to support the FY01 projects.
3. Calculate actual ROI for a random sampling of FY01 projects.

PROJECT #: 99.035
TITLE: Balanced Scorecard - Page 2

COST:
$30,000

PRODUCT:
Meeting minutes for each group and related project documents (i.e. to include standard strategic initiatives and metrics for future and current projects)

CUSTOMERS:
Facilities, Infrastructure, and Environmental communities

REMARKS:
Continuing activity from FY00.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
None required.

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 00.020

TITLE: Web Access to USGS Digital Quad Maps and DEM Data

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
To create a user-friendly point-and-click Internet Web site that offers access to the USGS digital raster graphics (DRG) and Digital Elevation Model (DEM) data (7.5-minute series) for downloading, viewing, mosaicing and printing.

This project would provide access to all the US available USGS DRG and DEM data to federal installation or field operating activities. Users would access the quadrangle maps graphically by locating them on a map of the US, or by entering the quadrangle name (aided by a series of pull down menus). This would permit users to download, view, mosaic, and print the specific quadrangle maps they are interested in.

JUSTIFICATION:
USGS has 7.5-minute DRG quadrangle coverage of parts of the US in a georeferenced tagged image file format (TIFF). TIFF is a format readable by most GIS software. In addition, the USGS is developing 7.5-minute DEM data for the US. USGS quads are often used to orient people to a location or to provide small scale mapping for various purposes, but are not always available for all users. The naming convention of the DRGs is cryptic and difficult to find specific quads. Map and menu access would save time when searching for specific quads and DEM data.

APPROACH:
Primary objective: Use appropriate Web-based language (such as JAVA or JAVAScript) to develop an interface that allows users to download, view, mosaic, or print all or portions of specific quads and/or the corresponding DEM maps. Specific steps are:

1) Define interface page layouts
2) Identify page interrelationships

PROJECT #: 00.020
TITLE: Web Access to USGS Digital Quad Maps and DEM Data – Page 2

3) Tag individual DRGs with real (not cryptic) names
4) Develop pull-down menus
5) Imbed appropriate view, mosaic, & print capabilities
6) Investigate the feasibility of purchasing and making available USGS DRG and DEM quadrangle maps for the United States and its territories. The costs associated with obtaining the digital maps, server to distribute the digital maps, and development and maintenance of the Internet Web site would be evaluated. Copyright and legal issues concerning distribution of the maps would also be evaluated.

COST:
FY2001 Complete (Steps 1-6): $45,000.

This sum assumes 18 weeks of one person at $70/hr. It also works out to be about $1,250 per USACE District.

Secondary objective: This sum would fund the purchase of USGS DRGs and DEMs for the United States and its territories IN ADDITION TO the DRG quads that various USACE Divisions/Districts have already acquired for their "service areas." (For example, the Baltimore District has DRG quads for DC, DE, MD, NJ, NY, PA, VA, and WV, and the Albuquerque District has DRG quads for NM and portions of CO and TX and available DEM data for the same states. The USACE would make this data available gratis for the national effort.

PRODUCT:
Web-based access to USGS DRG quadrangles and DEM quadrangles for the United States and its territories.

CUSTOMERS:
All U.S. Army, Navy, Air Force and Corps of Engineers entities. Access limited to .mil domain.

REMARKS:
1) This project is being proposed by three Center field user group members: Environmental (Margaret B. Martin, USACE - Baltimore), Civil Works (Ron Santos, USACE - Baltimore), and CADD (Frank Dopkowski, USACE - Baltimore).
2) The maximum number of military installations should be used as it will be the federal community that will have access. These numbers were taken from previous reports, and their accuracy should be verified.
3) USGS GLISMAPPER is similar, but the programming language requires modification to support the proposed product.

FY2001 funding will be necessary to complete the effort begun in FY2000.

PROJECT #: 00.020
TITLE: Web Access to USGS Digital Quad Maps and DEM Data – Page 3

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations

What is the measurable time or cost savings with the implementation/use of this product?
16 hours is an assumption of time to order, process, and edit the quadrangle maps. If the quads are not available from in-house repository, the time required to administratively process (accounting for all personnel efforts, not just the person placing the order) an order, scan the quadrangles when they arrive, and edit for electronic documentation, multiplied by 3,410 requests per year (10 requests x number of military installation and USACE Districts) equals $3,819,200. Ten requests per year for a USACE District is unrealistically low, but may balance out all installations' requests.

16 hrs x $70/hr x 3,410 requests = $3,819,200. B/C ratio = 76.4/1

What, if any, non-quantifiable benefits will be realized?
Factor, Efficiency, Professional Quality

Are commercial-off-the-shelf alternative products available?
Yes

If yes, what products?
Maps Raster

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

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TITLE: Web Access to USGS Digital Quad Maps and DEM Data – Page 4

Could this product be overtaken by commercial/industry developments within the next 2 years?
Yes

Is there anything similar currently in use?
Yes

If yes, what?
USGS GLISMAPPER

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 00.025

TITLE: Digital Topological Photogrammetric Recording Standards

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Compliance issues involving documentation of archeological features, rock art panels, and artifacts to be repatriated is required by many agencies and organizations in order to meet the requirements of the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and the Native American Graves Protection and Repatriation Act (NAGPRA), and other applicable laws. Traditional recording methodologies, such as photography and illustrations, meet recording requirements; however, these traditional approaches do not provide the accuracy or efficiency of photogrammetric methodologies. The recordation of complex, three-dimensional features is tedious, time consuming, and labor intensive with traditional methods. The traditional methods also fail to provide a medium that is easily accessed by other analysts for comparative purposes. Given that digital topological photogrammetry recording is in its infancy, the development of standards for recordation is imperative for the development of long-term, comparative databases. This project will ensure that through automation the various government agencies cultural resource compliance requirements can be met in an efficient and cost effective manner.

The objectives are:
1) Based on Phase I completed in FY00, develop recordation standards and control equipment for both field and laboratory recordation.
2) Document accepted procedures for processing stereophotos and protocols for access to data, presentation of data, and archiving of data.

JUSTIFICATION:
The development of digital topological photogrammetry recording standards as a method for cultural resource managers to document complex three-dimensional features, such as rock art panels or burials, with greater accuracy and efficiency is an innovative tool that will allow

expedient and accurate data recordation and analysis. Furthermore, the resulting digital images may be comparatively analyzed by anyone with access to the digital database. Researchers will be able to extract their own data set from the digital images. Photogrammetry also permits monitoring of deterioration or damage to such feature through comparison of stereophotos taken at periodic intervals. Digital photogrammetric recordation of artifacts to be repatriated will permit analytical access long after the artifacts has been repatriated or curated. Monitoring of suspected damage to archeological and Architectural properties form low altitude overflights would be of benefit to those services justifying Military Training Routes to environmentalists and Native Americans.

It should also be noted that the overall concepts of digital topological photogrammetric recordation could be applied to a variety of environmental issues and supply the innovative solutions to land use management issues that apply to all government agencies. The specific development of standards as they apply to cultural resource management shall serve as a case study. Further studies pertinent to other environmental issues will be initiated as a follow up project or as a continuation to this project, contingent upon funding.

APPROACH:
Component 1: Develop database structure and data dictionary. Using the SDSFIE database structure, develop the entity set, graphic feature name, attribute names, and domain values for recordation standards and provide the corresponding definitions.

Component 2: Recommendations related to Digital Storage and Access
Make recommendations on the complex issues surrounding the archiving of and access to digital databases.

COST:
Component 1: $ 75 K
Component 2: $ 75 K
Total $150K

PRODUCT:
Detailed methodologies and procedures for data collection and processing. Prototype models of control equipment will be illustrated. Product will be provided in hardcopy and on CD-ROM.

CUSTOMERS:
Direct users would be government or contractor personnel who are charged with recordation tasks under NEPA, NHPA, or NAGPRA compliance. All Center-affiliated agencies would benefit from the efficiency of recordation and increased access to comparative databases.

REMARKS:
It is anticipated that this project would be phased over a two-year period.

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TITLE: Digital Topological photogrammetric Recording Standards - Page 3

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 80 installations
Corps - 41 District offices
Navy - 110 installations
Air Force - 1100 installations
Other agencies - 29 offices

What is the measurable time or cost savings with the implementation/use of this product?
Significant reduction in cost of recordation in both field and laboratory contexts. Independent analyses can be conducted from a distance without expense of travel costs and replication of existing data.

What, if any, non-quantifiable benefits will be realized?
Quality of research will increase significantly due to access to databases that were previously unavailable.

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

Are hardware or software upgrades required?
No

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
No

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 00.026

TITLE: Automation of USGS Digital Data into Spatial Data Standards - Phase II

ORIGINATOR AND SERVICE PROPONENTS:
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Center POC - Nancy Towne, (601)634-3181, townen@wes.army.mil

REQUIREMENT AND OBJECTIVES:
Facilitate the conversion of USGS Digital Line Graphs (DLG), Digital Raster Graphs (DRG), and Digital Elevation Model (DEM) data which includes entities into a data set with Spatial Data Standards. Provide a tool and instructions for converting USGS digital mapping data into a database structure created by the implementation of the Spatial Standards.

JUSTIFICATION:
Base data (Hydrology, Transportation, Public Lands Survey, and others) available from USGS is one of the most complete digital data sets available for use with many civil works and military GIS applications. Currently USGS DLG, which is in Standard Data Transfer Standards, can be converted to Intergraph MGE or ESRI ARC/INFO using the vendor's USGS tools. To convert this into the Spatial Data Standards is time consuming and labor intensive. In other words, the data can be made compatible, but the process is time consuming and requires technical expertise and resources often not available at the District or organization level. With decreasing resources, many organizations do not include the use of GIS in he scope of a new project because of the up front costs of converting data for this base data. The development of a conversion routine will provide cost savings and make it possible for Districts and organizations to use GIS.

APPROACH:
Continue with FY 2000 effort which has focused upon developing and documenting methods for creating SDSFIE compliant data from USGS files.

1. Review existing software that converts USGS DLGs that are in the SDTS into vendors' formats.

PROJECT #: 00.026
TITLE: Automation of USGS Digital Data into Spatial Data Standards - Phase II - Page 2

2. Develop automation tools to convert USGS graphics and entities into the Standards that can be loaded into new or existing projects.

3. Provide the tools and workflows for use by the new and experienced GIS developer.

4. Process extensive geographically representative sample data.

COST:
FY 2001:

Develop and document workflows:	$35,000
Process extensive geographically representative sample data sets:	$35,000.

(process as many data sets as funds allow)

Partnering with Corps of Engineers, New Orleans District for sample map conversion is probable.

PRODUCT:
The product will be a user's guide for step-by-step conversion of USGS digital mapping data into SDSFIE compliant formats. The guide will include data conversion templates, predefined parameter files, and sample input/output data files in usable digital form.

CUSTOMERS:
The customer will be all Districts, bases, and facilities as well as other state and local government/private sector users of the Spatial Data Standards.

REMARKS:
Time line: Completed in FY 2001 by Task Group, Laboratory, or under continuing contract through the CADD/GIS Technology Center.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 75 installations
Corps - 40 district offices
Navy - 40 installations
Air Force - 60 installations

What is the measurable time or cost savings with the implementation/use of this product?
Knowledge of previously completed similar projects in other offices could save an Engineer, GS 11, Step 5, approximately 4 days per quad sheet. Assuming 50 quad sheets per year at approximately 100 installations, the total savings would be about $8,300,000 per year.
B/C ratio = 118.7/1

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TITLE: Automation of USGS Digital Data into Spatial Data Standards - Phase II - Page 3

What, if any, non-quantifiable benefits will be realized?
The conversion program will encourage the use of GIS.

Are commercial-off-the-shelf alternative products available?

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 00.027

TITLE: Aerial Photography Management System - Phase II of 99.032

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Aerial Photography data users collect thousands of aerial photos per year. These new data sets are generally not catalogued at frame level in any standard electronic system. Also, historic photo data sets usually remain uncatalogued. The New Orleans District (MVN) began to address this predicament in 1993. MVN's efforts have evolved into a suite of software utilities that address many aspects of photo data management. Software tools include:

Aerial Photo Layout (AIRFLOP) - CADD-based tool used for flight planning and cost estimating

Aerial Photo Flight Path Digitizer (AIRINDEX)- CADD-based program for digitizing flight paths from paper maps

Aerial Photo Search (AIRFIND) - CADD-based graphical query tool for locating mission data at frame level

APSRS Extract - Create files for direct load into USGS Aerial Photo Summary Record System (APSRS).

These tools were built with DOS-era compilers, have direct linkages to the ORACLE RDBMS, and lack important support for multiple input coordinate systems. Data is stored in local XY coordinate system rather than Latitude/Longitude. These tools matured before the era of WWW technology and lack modern WWW connectivity. However, these tools also use portable MicroStation Development Language (MDL) and standard FORTRAN & C languages. The RDBMS aerial photo database structure also directly supports the Corps REEGIS data standard now fully incorporated into the SDSFIE. The applications also directly support the database

record formats used in the USGS Aerial Photo Summary Record System (APSRS). Therefore, the software utilities have the potential for modernization into generic photo data management tools that support the Center efforts.

The Topographic Engineering Center (TEC) also demonstrated their technical capability and ability to economically develop a WWW-based aerial photo query system via WWW forms. This capability may be integrated with the CEMVN software to create a complete system for government use. Demo at: http://crunch.tec.army.mil/photodemo_search.htm.

New Orleans District's initial efforts and TEC's demo indicates an opportunity for fielding a standardized system and common method for photo data capture, management, and data retrieval.

We propose using this collection of software and WWW utilities as functioning prototypes for modernizing into an integrated, standardized aerial photo management system. It will support both industry photogrammetric standards and government standards (SDSFIE, APSRS). These tools will be upgraded to support multiple input data sources and extract coordinate systems. They will allow use of generic RDBMS systems, via ODBC, rather than direct linkage to a single vendor. The system will allow WWW textual queries as the primary user query interface, graphical CADD-based photo queries, and possibly WWW-based graphical queries.

JUSTIFICATION:
All installations plan, acquire, and manage aerial photography in support of their planning, design, regulatory, and maintenance missions. Access and reuse of historic photo data is often vital in adding value to newly collected imagery. Also, over twenty Corps Districts are on record as having contributed to the USGS APSRS. They would all directly benefit from aspects this system for streamlining holdings reporting to USGS.

APPROACH:

Continue with FY 1999 effort. This effort produced the following:

1. A technical review of two existing Corps Aerial Photography Layout and Management systems, combined with a review of industry standard flight mission management & photo management systems
2. An optimum feature matrix and list from the two Aerial Photography Layout systems reviewed in Phase I deliverable

The final product will consist of a standardized software suite in a Windows environment that integrates and enhances the technical review and the feature matrix. This will make existing tools for aerial photo flight planning, aerial photo collection and management available and support research and outreach efforts within the DoD. Complete primary effort by September 2000.

PROJECT #: 00.027
TITLE: Aerial Photography Management System - Phase II of 99.032 - Page 3

COST:
FY 2000: $75,000

Continue with FY 1999 efforts. Identify items of work for software development/conversion and WWW development.

Work with aerial photo equipment vendors to develop standards for efficiently loading of DGPS aerial photo camera coordinates directly into aerial photo databases. Draft updates to appropriate Corps Engineer Manual (EM) to define and support aerial photo data collection standards. Enhance Corps software to support multiple vendor input formats for aerial photo flight data.

Develop a similar ARC/INFO (AML-based) photo querying system that is comparable to the querying and photo layout system developed for MGE environment graphical querying interface.

PRODUCT:
Final product consists of a standardized software suite in a Windows environment that integrates and enhances existing tools for aerial photo flight planning, aerial photo collection and management, and supports research and outreach efforts. Complete primary effort by September 2000.

CUSTOMERS:
All aerial photo users within the Corps of Engineers, Army, Navy, Air Force, other Federal, State, and local agencies, Architect Engineer firms, and the general public.

REMARKS:
Time line: Completed in FY 2000 by Task Group, Laboratory, or under continuing contract through the CADD/GIS Technology Center.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 75 installations
Corps - 40 district offices
Navy - 42 installations
Air Force - 60 installations

What is the measurable time or cost savings with the implementation/use of this product?
The CEMVN Files Staff reports that each extensive photo database search is now saving two hours of research and report preparation per photo research request. Estimating ten photo requests per week, New Orleans District is now saving sixteen hours per week or over 800 man-hours per year in photo research. (NOTE: The New Orleans Files Room had 15 requests the week of March 9, 1998 and averages 8 to 10 requests per week.)

A File Clerk's cost will be an hourly rate for a GS-5 step 5 will be approximately $21.60/hour.

Savings are approximately $21.60/hour X 800 hours = $17,280/year at the New Orleans District.

Assuming all other Districts have only 25% of the photo requests of New Orleans District:
40 Districts x $17,280/year x .25 = $172,800 labor savings per year.

The first year cost for this project is $60,000.

Assuming a 3 year life of software before requiring significant maintenance, the benefit/cost is 3 x 172,800 / 60,000 = BC Ratio of greater than 8 within the Corps.

What, if any, non-quantifiable benefits will be realized?
This product will assist in the implementation and acceptance of the Spatial Data Standards (SDSFIE). The value to the public of increased access to Aerial Photo data holdings is immeasurable and salutes the Presidential Executive Order 12906 for Metadata and electronic data accessibility. There may also be value in possible centralization into a single photo database.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 00.032

TITLE: Development of a SDSFIE/FMSFIE to GMS Interface

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Complete electronic interface currently being developed to allow extraction of field data from a Spatial Data Standards for facilities, infrastructure, and environment (SDSFIE)/Facility Management Standards for facilities, infrastructure, and environment (FMSFIE) compliant database and load it into the Department of Defense Ground Water Modeling System (GMS) for groundwater modeling use.

An interface is being developed to facilitate entry of all data fields necessary to perform modeling within GMS. At a minimum, the ability to import field data (e.g., x, y, z, stratigraphy data, water level, etc.) and their various attributes will be accomplished.

JUSTIFICATION:
Many users have existing databases containing field data from environmental sites. These same users may have several databases in different forms or may not have a functioning Geographic Information System (GIS) in place to utilize this data. The SDSFIE provides a standardized schema for storage of spatial data, including environmental data. With SDSFIE/FMSFIE as the standard schema, an interface can be written to extract data from the SDSFIE/FMSFIE schema for use in building input files for the models supported by GMS. Such an interface would negate the need for double entry of data; once for the project database and once into GMS.

APPROACH:
Working jointly with the GMS Program Manager, work on an Interface Design Document was started under CADD/GIS Technology Center Project No. 97.022. This Design Document was completed in early FY2000. Implementation efforts based on the design document were initiated in mid FY2000. FY2000 funding will complete the implementation of the Design Document.

PROJECT #: 00.032
TITLE: Development of a SDSFIE/FMSFIE to GMS Interface – Page 2

COST:
FY2001 cost to complete and update the FY2000 project development is $ 25K.

PRODUCT:
Development of a new GMS module to allow extraction of data from SDSFIE/FMSFIE-compliant databases was begun in FY2000. This module will be distributed with other upgrades to the GMS interface via existing methods (FTP download, CD-ROM, etc.).

CUSTOMERS:
As of 31 Dec 98 there were 767 licensed users of GMS in DoD, DoE, and EPA. Of these 767 users, 551 are in DoD and 216 are in DoE and EPA. There are over 1400 private sector registered users.

REMARKS:
The number of offices given in the GPRA analysis below represent individual registered users of GMS in the various services. Numbers are not available regarding the actual number of offices using the product, or the number of offices with multiple registered users.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 184 installations
Corps - 187 district offices
Navy - 118 installations
Air Force - 54 installations

What is the measurable time or cost savings with the implementation/use of this product?
Standard methods of selecting data points, querying the database, and hand-entering data into the ground-water model takes approximately 16 hours. Use of the new interface would reduce this time to 2 hours or less. If only half of the registered GMS users perform one modeling study per year, a time savings of approximately 3,800 man-hours would result. At a labor rate of $60/hr (including burden), this equates to cost savings of $ 228,000 per year. B/C ratio = 28/1

What, if any, non-quantifiable benefits will be realized?
Fewer errors in data entry, resulting in improved accuracy of model results. Time savings in improved data manipulation capabilities will allow more simulation runs to be performed, allowing evaluation of a greater number and variety of project remedies.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

PROJECT #: 00.032
TITLE: Development of a SDSFIE/FMSFIE to GMS Interface – Page 3

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
Yes

If yes, at what cost per workstation and/or user?
Zero; DoD-owned software; no hardware upgrades required.

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 00.038

TITLE: Floodplain Economic Management Analysis - "FEMA"

ORIGINATOR AND SERVICE PROPONENTS:
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Jean McGinn, (202)761-1052, jean.a.mcginn@usace.army.mil
Navy Proponent - Jim Carberry, (202)685-9037, carberryjj@navfac.navy.mil
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REQUIREMENT AND OBJECTIVES:
COE and FEMA are the prime flood work agencies. Every time a flood occurs, the flood damage assessment is slow and not forthcoming. Our District takes roughly a year to complete flood damage assessments; this is because the time required to collect field data and the slow process of picking up the damage values from a hard copy plot of the flood plain. Our District tried for years to ask some GIS vendors to incorporate some procedures into their GIS analysis tools. MGE came the closest to what we desire to do the job. However, a standard procedure does not exist to complete a GIS flood damage assessment. This proposed project, Floodplain Economic Management Analysis - “FEMA”, will develop the related GIS standards and a software platform to geo-spatially assess the damage of flooded area with a 3D terrain surface model, 3D water surface model or 3D depth surface and a GIS real estate data base.

We propose using a standard GIS platform to assess floodplain damage based on the location and elevation of the real estate, and the depth of flooding. This project will develop common guidelines for the GIS analyzing procedure from collecting real estate database to geo-spatial query method, to interactive mapping using an Internet browser. Also, this project will develop an automated economic/real estate data collection format using basic stage damage models for typical lands and structures. All data format should comply with SDSFIE.

JUSTIFICATION:
Currently, the flood damage assessment is performed in several phases:
1. Othrophoto survey of the damaged area. A 3D surface is created for hydraulic analysis.
2. Hydraulic analysis is performed to determine the floodplain and water surface elevation.
3. The floodplain is plotted on a hardcopy map with water surface elevation contours.
4. A real estate value collection is performed by driving around the flood neighborhood.
5. The real estate value is combined with floodplain information on one-by-one basis manually.

PROJECT #: 00.038
TITLE: Floodplain Economic Management Analysis - "FEMA" – Page 2

6. The damage value by the flood is summed up in a spreadsheet.

When the floodplain boundary or floodwater elevation are updated by FEMA, COE or local agencies, the flood damage assessment is performed all over again from step 2 though 6. Different agencies do these steps differently, from computer software to damage evaluation. A standard GIS platform with a stored and updateable GIS database would be an ultimate solution to replace the current repetition and the prolonged process of flood damage assessments by government agencies. Using a GIS platform, the real estate value needs to be input only once. The input can then be used many times in the GIS database query analysis to estimate damages for various flood events.

APPROACH:
FY 2000: 1. Collect inputs from USACE Districts on their approach for Floodplain Damage Assessment Projects.(FDAP). 2. Identify the most effective FDAP procedure to meet the established regulation (ER1105-2-100 Guidance for Conducting Civil Works Planning Studies, Chapter 6, and, ER1105-2-101 Risk-Based Analysis for Evaluation of Hydrology/Hydraulics, Geotechnical Stability, and Economics in Flood Damage Reduction Studies). 3. Identify the GIS applicable routine in the FDAP procedure.

FY 2001: 4. Work with GIS vendors (preferably Intergraph from Huntsville, AL) to develop standards for efficiently loading of geographically referenced Aerial photos (Geotiff, Arc-tiff, etc), 3D terrain as well as GIS floodplain spatial layers (including real estate value, floodplain boundary, damage value curve, etc) directly into one single platform of software (preferably MGE). 5. Develop a standard procedure to assess the flood damage based on the depth of water in the real estate (house, farm, storage, etc) as well as the assessed real estate value. The assessment will be completed with automatic GIS input and output from multiple vendor formats on the same platform as #4. 6. Implement a standard output GIS format so that the damage can be reflected with GIS polygons and attributes on a CADD platform as well as a WWW interactive map. The attribute data should also be output to a spreadsheet for other assessments.

COST:
FY 2001: Items 4-6: $70,000

PRODUCT:
A recommendation report for the most effective FDAP procedure and the identified routine is scheduled to be completed in FY2000.

FY 2001: Final product consists of a standardized GIS software and procedure in a Window environment that can display the delineated floodplain on a 3D surface terrain as well as geographically projected aerial photos and GIS economic layers. The product is able to spatially query GIS economic attributes based on the 3D surface terrain.

PROJECT #: 00.038
TITLE: Floodplain Economic Management Analysis - "FEMA" – Page 3

CUSTOMERS:
All hydraulic design, economics management, and floodplain management users within every districts of the Corps of Engineers, Army/Navy/Air Force GIS units, other Federal, State, and local government agencies, Architect Engineer firms, and the general public who are interested in GIS floodplain economics applications.

REMARKS:
This cross-disciplinary project requires the coordination of GIS specialists, hydraulic engineers, real estate specialists as well as economists. The end product will benefit each group for effectively integrating data from each group and completing the flood damage assessment in a timely manner.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - installations
Corps - 41 district offices
Navy - installations
Air Force - installations

What is the measurable time or cost savings with the implementation/use of this product?
The flood damage assessment projects (FDAP) can vary from 5-10 per year each COE District , depending on the flood situation and the economic development of the project area (Sacramento District may do 20 FDAPs in one year). Using 30 Corps Districts the following analysis is provided:

> $50,000/FDAP x 7 FDAPs/Year/District x 30 District = $10,500,000 annual cost for Corps alone

If the proposed product is implemented, the floodplain economic information (such as parcel value, # of parcels, structural elevation, etc) can be stored on GIS digital platforms. So the data will not need to be re-collected after every flood or after the floodplain boundary is changed. The number of FDAP will be reduced as well as the cost of doing FDAP will be reduced. Using 30 Corps Districts the cost of using the product:

> $10,000/FDAP x 5 FDAPs/Year/District x 30 District = $1,500,000

Therefore, the saving could be $9,000,000 a year! This is not including the time saving for replacing the paper work analysis with the digital data analysis. B/C ratio = 120/1

PROJECT #: 00.038
TITLE: Floodplain Economic Management Analysis - "FEMA" – Page 4

What, if any, non-quantifiable benefits will be realized?
Non-quantifiable benefits include use of the software and GIS procedure by other Federal and state agencies, such as FEMA and Department of Water Resource in each State. Moreover, while the flood damage assessment will be more productive and effective, the people in the flooded area will benefit the most.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?
Intergraph's MGE and GeoMedia Pro comes the closest.

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?
2 people per agency.

Are hardware or software upgrades required?
Yes

If yes, at what cost per workstation and/or user?
$2,000 per user.

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 00.039

TITLE: SGML Prototype for Electronic Delivery of Facilities Operation & Maintenance Information

ORIGINATOR AND SERVICE PROPONENTS:
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Other Proponents:
(1) Facilities Maintenance & Operations Committee (FMOC) Dr. Brodt, Chairman
(2) National Institute of Standards and Technology (NIST) Leader Computer Integration Construction Group, Dr. Kent Reed
(3) America Society for Testing and Materials Committees E.6 Performance of Buildings
(4) National Institute of Building Sciences (NIBS) National Research Council, Federal Facilities Council

REQUIREMENT AND OBJECTIVES:
There is a requirement to use as-built products and O&M data to operate, maintain and repair a Facility. The development of an electronic delivery standard for manufacturer's information concerning installed products would facilitate that requirement.
The objectives of this project are:
1) Develop a prototype SGML Document Type Definition (DTD) for Facilities Maintenance & Operations standard which would address electronic delivery of manufacturers product information (O&M manuals, product specifications, troubleshooting procedures, etc.), utilization of CAFM drawings, and Commercially Available Computer Maintenance Management Systems (CMMS), (e.g., MAXIMO) to develop smart facilities and smart systems.
2) Research development of CAD design standards or recommended practices for capturing manufacturing data from design through construction.
3) Develop standard for electronic delivery of manufacture's information concerning installed products. Utilize online specifications to monitor and enhance system operation; reduce preventive maintenance costs by monitoring operating statistics and historical performance measurements.

PROJECT #: 00.039
TITLE: SGML Prototype for Electronic Delivery of Facilities Operation & Maintenance Information – Page 2

4) Develop standards & prototype for CAFM system for storing and maintaining Facility Information. Initiate Facilities Maintenance standard or recommended practices for electronic publication of manufacture's information that can be loaded directly into customer's computer maintenance management system.

JUSTIFICATION:
This project will:
(1) Provide intelligent as-built drawings (CAFM information with manufacturer's data).
(2) Eliminate re-keying design and manufacturing data.
(3) Provide smart systems, accumulate historical data online monitoring.
(4) provide more efficient repair response, reduced downtime / improved mission readiness & safety.
(5) Facilities Commissioning or recommended practices.
(6) Save O&M dollars

APPROACH:
Develop Facilities Maintenance & Operations Document Type Definition (DTD) and Formatting Output Specification Instance (FOSI) to prototype electronic delivery of tagged manufacturer's data into computer maintenance management systems.

COST:
Total Cost: $167,860 (Execution will be phased over 3 years.)
Phase 1 (FY00): $54,630 Training: $16,550; Labor: $28,080; Software: $10,000
Phase 2 (FY01): $59,960 Training: $25,120; Labor: $24,840; Software: $10,000
Phase 3 (FY02): $53,270 Training: $ 4,190; Labor: $19,080; Software: $30,000

$72,000 Labor 1,600 hrs/year@45.00
$45,860 Training SGML (FOSI Development: $4,515)
SGML (DTD Development: $3,525)
Texcel IM (SGML Database: $6,500)
CMMS (Maximo Training: $3,000)
ORACLE (DBA, Forms, System Modeling: $19,120)
Data Modeling (Erwin CASE Tools Training $3,200)
CAFM (Databases Connectivity: $5,000)
Intercap (CGM Author: $1,000)
$50,000 Software Erwin/BPwin ($6,000)
Document Architect ($4,000)
Maximo ($15,000)
Oracle ($2,500)
Texcel IM (15,000)
Intercap Author ($7,500)

PROJECT #: 00.039
TITLE: SGML Prototype for Electronic Delivery of Facilities Operation & Maintenance Information – Page 3

PRODUCT:
Implementation plan / prototype for electronic delivery of manufacturer's operations and maintenance information. This will facilitate a workable solution for government and industry standardization.
Electronic delivery of manufacturer's information will provide a tool that helps the facility user and Public Works staff effectively operate, maintain, and repair a facility. The SGML product organizes facility information and data provided by the construction contractor during construction; integrates and expands O&M repair information. It provides a tool needed to ensure a new facility looks and performs well over its entire life cycle at a minimum cost. This project ties in with three CADD/GIS Technology Center Projects:
- Facility Management Standards
- Equipment (Maintenance Support)
- Integration of CADD and GIS Standards and Digital Data

A workable copy of the prototype project will be provided to the Center for demonstration/display purposes. Project products will be available for use by other organizations.

CUSTOMERS:
Provides a turn-key approach to O&M of new Facilities, customer is provided a completely organized and automated package of facility information that will be utilized and maintained throughout the life of the facility. Customers would be the facility user / owner and the maintenance and operation organization such as the Public Works Department, Base Civil Engineer, etc.

REMARKS:
With automation it is now possible to capture all Facility Information created during the acquisition of a new facility. Through standardization of this information, O&M data can be provided to the customer and easily captured and maintained as part of a CAFM / Electronic Document Management system. Project easily falls within functional category of Application Development, but may be best suited under Standards or Recommended Practices. (Note: The originator is using Center funds to purchase software and equipment for use at LANTDIV. If this project is approved, then the purchased equipment and software should be provided to the Center at project completion.)

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - All offices using CMMS at installations
Corps - All offices using CMMS at district offices
Navy - All offices using CMMS at installations
Air Force - All offices using CMMS at installations

PROJECT #: 00.039
TITLE: SGML Prototype for Electronic Delivery of Facilities Operation & Maintenance Information – Page 4

What is the measurable time or cost savings with the implementation/use of this product?
Total estimated savings DoD wide = $9,360,000. Total estimated annual savings within the Navy = 120 installation projects/year x $24,000/project = $2,880.00. B/C ratio = 1.7/1

What, if any, non-quantifiable benefits will be realized?
Increased communication and standardization.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?
2 persons to develop project prototype. One person at each installation where implemented.

Are hardware or software upgrades required?
Yes

If yes, at what cost per workstation and/or user?
1 station @ $50,000

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
Other industries are utilizing standardized approach for Facilities O&M.

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.001

TITLE: Leveraging Local Goverment Geographic Information Using SDSFIE

ORIGINATOR AND SERVICE PROPONENTS:
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Center POC - Nancy Towne, (601)634-3181, townen@wes.army.mil

REQUIREMENT AND OBJECTIVES:
Local governments expend considerable resources annually creating highly accurate digital geographic information that could greatly benefit facility and operational planning efforts neighboring defense installations. These data sets are in a large part unaccessible due to the lack of standardized file formats. In 1996 the Federal Geographic Data Committee (FGDC) funded a report recommending that the CADD/GIS Technology Center Spatial Data Standard for facilities, infratructure, and environment (SDSFIE) be used for large scale (local government) data sets. Local government implementation of the SDSFIE is limited. This project will fund the development of SDSFIE entity sets used by local governments and promote their adoption with on-going FGDC efforts.

JUSTIFICATION:
Tremendous data duplication exists in government due to the inability of agencies to easily share data. By modifying and promoting a national standard for spatial data, the complexity of sharing data could be greatly reduced.

APPROACH:
The project will use existing state and local GIS coordination groups to reach concensus and provide training on this project. Some of these groups include the Kern Geographic Information Network (Kern GEONET); the San Joaquin Valley Spatial Information Systems Institute (SJV ISIS); the California Geographic Information Association (CGIA); and the Federal Geographic Data Committee (FGDC). One of the primary goals of the project will be to develop a customized interface to the SDSFIE for local government users.

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TITLE: Leveraging Local Goverment Geographic Information Using SDSFIE – Page 2

COST:
This one year project is estimated to cost $60,000 or one person year.

PRODUCT:
1) The project will prepare a report with recommendations on changes to adapt the SDSFIE to local government use.

2) The project will provide an easy to use interface for implementation of the SDSFIE.

3) Quarterly status reports will be done on the project

CUSTOMERS:
Eleven local government jurisdictions in the Kern County, CA region. China Lake NAWS, Edwards AFFTC, the San Joaquin Valley ISIS Center, the California Geographic Information Association, and the Federal Geographic Data Committee.

REMARKS:
Local government participation in the SDSFIE has been extremely limited. This is due to the complexity of the SDSFIE. The City of Bakersfield (Kern County, CA) has been implementing the SDSFIE for the past two years and has developed an adaptation of the standard that may be suitable for nationwide use by local governments. This project will bring this experience to combat the hurdles in local government implementation.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 50 installations
Corps - 100 district offices
Navy - 50 installations
Air Force - 50 installations
Other Agencies - 25 installations

What is the measurable time or cost savings with the implementation/use of this product?
1000 hours minimum per facility done at a GS 11 base rate in gathering and convering local government data sets for operational planning. The total savings would be about
1000 hrs * (50+100+50+50+25) = 275,000 hrs
which would be $6,462.50 per year. B/C ratio = 107/1

What, if any, non-quantifiable benefits will be realized?
Elimination of duplicate data development by governments, as well as access to highly accurate data developed at the local government level. Local governments, because they are so close to their data, tend to build data sets that are far more accurate and detailed than regional and federal agencies.

PROJECT #: 01.001
TITLE: Leveraging Local Goverment Geographic Information Using SDSFIE – Page 3

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?
3

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
Yes

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.002

TITLE: Methods to Visualize Geographic Information System (GIS) Data Quality

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Develop methods to indicate data quality to the GIS user. Demonstrate that GIS users will make better decisions when the displayed graphical map or coverage contains or is tied in with some type of visual feedback which indicates the quality of the underlying data. Focus on NIMA GIS data features supplied for military planning and operations. Document methodology for incorporation into Federal Geographic Data Committee (FGDC) metadata standards.

JUSTIFICATION:
GIS is becoming more prevalent as a viable tool for tactical, strategic, and good-will missions. However, erroneous conclusions can easily propagate. With the ease of data translation, the user can scale and make other graphical changes on the fly. This permits decision-making based upon pseudo-virtual resolution. This can be corrected by providing the user with instant visual feedback as to data quality during any given spatial manipulation. The user will now be less prone to use the data beyond its cartographic limits. GIS users (both civilian and military) range from managers and officers, to mid-level analysts and planners, to military recruits and other personnel in the field. Training can be employed to educate the GIS user on decision, accuracy, scale, density, classification, etc. Training budgets are limited and training can not prevent normal memory loss. However, just-in-time training or knowledge awareness is implemented under the 'visualize data quality' approach. Providing the GIS user with data quality indicators will improve the tactical and strategical decision-making processes.

APPROACH:
Investigate the National Imagery and Mapping Agency (NIMA) feature set as defined in the International Digital Geographical Exchange Standard. Identify possible feature candidates

whose respective data display could easily be augmented with meaningful visual feedback as to data quality. Consolidate this feature subset into categorizing the object types as line, polygon, point, grid, and image, along with the corresponding description of associated metadata positional parameters. Develop various techniques which would eliminate the propagation of uncertainty associated with the data being displayed. Investigation display techniques should include at least variations in line width, style (dashed, dotted, etc.), color (hue, brightness, contrast), symbols, and polygon fill patterns. Other possibilities are data layer deactivation of fuzziness, menu pop-ups of differing variety, window frames changing color, and separate animated windows with the data quality icon changing shape and/or focus and any useful combinations of these. For each of the investigated features, compare the graphical samples and document the advantages and disadvantages for each technique. Prepare a synopsis of this investigation and present these potential data quality propagation techniques to the research participants, represented by government, academia, and industry (participants listed in a proceeding section). Incorporate other media issues such as printer versus screen use of colors and gray-scale, and alternatives to assist the visually challenged. Incorporate feedback from the research participants and work for consensus. Prioritize those features and associated display methods which the research participants feel would make the greatest improvement. Finalize the conclusions and develop related documentation compatible for submitting proposed enhancements to existing policies and standards, such as Spatial Data Transfer Standard (SDTS) and the Spatial Data Standards for facilities, infratructure, and environment (SDSFIE).

Phase I: Create a subset of selected features focusing on the new Littoral Warfare Data Set from NIMA. Concentrate the effort on horizontal positional data quality issues for each feature of the subset. Develop methods to use GIS to visualize the positional data quality for each selected object. Propose solutions and use modified Delphi method for obtaining comments and consensus from government, academia, industry, and consortiums.

Phase II: Translate Phase I solutions into requirements and submit to GIS standards and policy thrusts, such as the International Standards Organization (ISO) WD 15046-15 Geographic Information - Part 15: Metadata, the ISO/TC 211 initiative, the Open GIS Consortium (OGC), and the National Spatial Data Infrastructure (NSDI).

Note: Phases 3 through 5 are described in the remarks sections.

Participants: The following organizations are proposed participants to this research/review of NFESC's technical report documenting methodologies. It is expected that the organizations will participate at no cost to this project. A contingency fund however is budgeted to allow limited

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TITLE: Methods to Visualize Geographic Information System (GIS) Data Quality – Page 3

Simplified Acquisition Procurement (SAP). The following are the proposed academia and governmental participants:

Naval Facilities Engineering Service Center
1100 23rd Ave.Port Hueneme, CA 93043-4328

National Imagery and Mapping Agency
8613 Lee Hwy Fairfax, VA 22031-2137

Naval Meteorology and Oceanography Command
1020 Balch Blvd. Stennis Space Center, MS 39529-5005

Engineering Research and Development Center, Waterworks Experiment Station
3909 Halls Ferry Road Vicksburg, MS 39183-3435
University of California Santa Barbara National Center for Geographic Information and Analysis
3510 Phelps Hall Santa Barbara, CA 93106

Federal Geographic Data Committee (FGDC) C/O USGS
590 National Center Reston, VA 20192

COST:
Cost Sharing: A SPAWAR funded project will provide approximately $15,000 per year in addition to the following cost estimate.
FY01 Phase I $130,000
FY02 Phase I $ 35,000
FY02 Phase II $ 96,000
FY03 Phase3 $126,000
FY04 Phase4 $149,000
FY05 Phase5 $195,000

PRODUCT:
Each phase will contain deliverables as applicable, such as:

Technical solutions report.
Interactive software demonstration to research participants.
Report and software consolidating feedback from research participants.
Proposed documents for incorporation into metadata standards or policies.

CUSTOMERS:
NIMA and other Federal GIS data providers. Military, commercial, and Civilian users engaged in GIS analysis.

REMARKS:
Phase 3:

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Perform Phase I and Phase II for majority of the remaining NIMA feature set and include data quality visualization techniques for data quality where both horizontal and vertical positional data quality is involved.

Phase 4:
Expand error display descriptors to variable resolution products, e.g. NIMA is developing a variable resolution bathymetric data set. Include data quality visualization techniques for other metadata parameters such as precision or temporality.

Phase 5:
Expand error display descriptors to 3D views, and the Object Oriented GIS (OOGIS) language framework. 3D geo-spatial displays and OOGIS provide further complications which require additional research.

Future Work:
Expand error descriptors into error models. Error descriptors present the known discrepancies on each layer displayed. Whereas an error model understands those errors for derived products such as slope map or an overlay of several combined layers. The error model develops a new error margin for the resultant composite layer. This research will help improve automatic codified decision tools.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 60 installations
Corps - 60 district offices
Navy - 40 installations
Air Force - 70 installations
Other Agencies - 200 installations

What is the measurable time or cost savings with the implementation/use of this product?
80 hours minimum per facility done at a GS 11 rate in methods to indicate data quality. The total savings would be about

80 hrs * (430) = 344,000 hrs

which would be $27,520,000 per year. B/C ratio (for 6 years) = 37.65/1.

What, if any, non-quantifiable benefits will be realized?
The GIS industry is proactive to implement improved metadata standards and policies into their COTS. Resultant software upgrades will benefit those military projects which utilize GIS as a decision-making tool.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
Yes

If yes, at what cost per workstation and/or user?
$4K per year approx

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.003

TITLE: Object Oriented Model Development

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Currently, the Spatial Data Standard/Facility Management Standards for facilities, infratructure, and environment (SDSFIE), and the AEC CADD Standard are based on a relational structure. For the most part, they were developed independently and will require customized applications to be developed and maintained in order to move data between the standards. Object oriented technology is being implemented by many different GIS and CADD vendors.

This workunit would develop an integrated object oriented model for the SDSFIE/FMSFIE and AEC CADD standards. This model could then be used to develop an implementation of the standards in object-oriented CADD/GIS systems.

JUSTIFICATION:
If an object oriented model is not developed, the standards will either 1) become obsolete or 2) force the Center to develop a "hack" in order to keep up with the technology. Commercial vendors are currently producing object-oriented CADD/GIS technology. Users are more likely to use the Standards if they support current technology.

APPROACH:
This project would entail a 2-phase effort that would engage both government and the vendor community. It is envisioned that the vendor community would be engaged through the Open-GIS Consortium (OGC) and possibly the International Alliance for Interoperability (IAI) community. Phase 1 would entail developing a Feasibility Study with Government, OGC members, and IAI representatives outlining the details and issues involved in developing an object model for the Standards. The phase 2 effort would entail developing use cases and

ultimately a UML Model that can be used to implement the standards in various vendor product models.

COST:
FY01 - 150K

PRODUCT:
Phase 1 - Feasibility Analysis; Strategic Plan for developing an object-oriented standard.
Phase II - UML Object Model for the SDSFIE/FMSFIE

CUSTOMERS:
All users of the standards that have commercial GIS and CADD systems.

REMARKS:
By using the OGC, we will have access to vendor community at a fraction of the cost it would take through conventional contracting. ROI has been estimated as 1 to 5 - for every $1 spent return of $5. B/C ratio = 50/1.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Government Contractors - 100 offices

What is the measurable time or cost savings with the implementation/use of this product?

The SDSFIE/FMSFIE can reduce the initial GIS Schema Development Cost by $150,000 for each typical individual installation GIS implementation. Each installation may have more than one GIS implementation. If only 10% of the offices/installations use the standards, the savings will be $6,615,000.

What, if any, non-quantifiable benefits will be realized?
Use of the SDSFIE/FMSFIE provides a nonproprietary format which permits GIS data to be easily shared between agencies. This ability will benefit the DoD, other Federal government, state government, local government, international, and private organizations.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

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TITLE: Object Oriented Model Development - Page 3

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
No

Is training required for the product?

If yes, how many people per agency?

Are hardware or software upgrades required?

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.004

TITLE: Web Based Design/Construction Collaboration System

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
There are numerous commercial off the shelf (COTS) world wide web based design collaboration software programs that allow online review of design drawings. Some of these same systems provide communication protocols for the management of construction project documents, including requests for information, change orders, submittal approvals, etc. Based on experience with Air Force, Army and Navy design processes, there appear to be no COTS systems that are fully aligned with the DoD business model related to design, advertise, and construct type projects. Several systems do a very good job of handling the design drawings and the basic construction management activities. None of the systems reviewed to date allow for an organized method of collecting review comments on project specifications, basis of design reports, cost estimates; collating comments from a wide range of reviewing agencies/offices; and providing a methodology to allow the designer and/or project manager to respond comments. Responses include concurring with the comment, not concurring with the comment, withdrawing the comment, or resolving the comment by direction.

JUSTIFICATION:
Benefits to this approach to project design are the reduced project management overhead costs related to the handling and distribution of multiple sets of design specifications and drawings. Additional cost savings are achieved by eliminating and/or reducing the cost of producing multiple sets of design documents for each review stage of the project development.

APPROACH:
One recommended model for handling review comments would be based on the Design Review Comment software package contained in the Construction Criteria Based (CCB) program

developed at LANDIV, Naval Facilities Engineering Command. The approach to this project would be to develop a web based data management system that could be used in conjunction with several COTS programs that work well with handling graphical data and construction communication processes.

Partnering opportunities can include cooperative development initiatives with the existing COTS software vendors. Project solutions should include support for multiple computer-aided design and drafting software programs.

Part of the deployment plan could include identifying data storage/web hosting sites for each of the services. An alternative solution would be to have the Center serve as the host for all of the services on an annual reimbursement basis.

COST:
Estimated cost of project development is estimated at $75,000 per year for two consecutive fiscal years.

The basis of cost is based on a best guess estimate. Accuracy for this estimate is unknown.

Cost sharing with potential COTS partners is unknown at this time. Potential partnering opportunities can not be assessed until one or more COTS developers can be identified to participate in the development of a business model for design review and construction management.

PRODUCT:
Final product is to be an affordable web based project management software that will allow design team members to provide faster input to design documents through online collaboration. Once the project is advertised and awarded the solution will allow the construction contractor, contracting officer, comptroller, project manager and quality control manager to better communicate during the project construction.

Research on this topic indicates that COTS solutions range in cost from $16,000 for a stand alone software package to on-line service providers that charge between $750 to $2,500 per user seat per project. The software-only solution requires the end user to set up a web-based server and is not included in the cost of the software. Firewall configuration and network security are key issues that need to be addressed as part of a successful deployment. The security issue is complex due to the need to allow design Architectural-Engineering (A-E) firms and construction contractors and subcontractors access to the web based server.

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TITLE: Web Based Design/Construction Collaboration System – Page 3

CUSTOMERS:
Direct and indirect customers include:

Department of the Navy	Marine Corps
Department of the Army	Coast Guard
Department of the Air Force	Defense Logistic Agency
State Department	General Services Agency
Federal Aviation Administration	Construction Contractors
A-E firms	

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 20 installations
Corps - 20 district offices
Navy - 30 installations
Air Force - 30 installations
Other Agencies - 30 installations

What is the measurable time or cost savings with the implementation/use of this product?
The potential cost savings is unknown or not fully quantifiable at this time. The actual cost savings depend on the number of installations and agencies that adopt this change in their project design business model. For the design phase of each project an estimated nominal $800 per project can be saved by eliminating the reproduction of drawings produced for each submittal phase of the design.

What, if any, non-quantifiable benefits will be realized?
Non-quantified savings can be realized by shortening the time it takes to take each project from statement of work to ready to advertise. Non-quantified savings can potentially achieved while the project is in construction by reducing the time it takes to approve material submittals, eliminate transmittal time for request for information (RFI) and reduce response time for the same, more efficiently handle contract change orders, reduce contractor claims for extended construction overhead, and allow for real time as-built drawing updates by allowing the changes to be made on-line.

Approximated cost savings:
50 installations
10 maintenance and repair projects per year
3 submittals per project
7 copies of submittal drawings and specifications (10 sheets per drawing set)
$200 per submittal
Subtotal = $600 per project

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TITLE: Web Based Design/Construction Collaboration System – Page 4

FedEx Charges = $ 75 per project
Subtotal = $675 per project
Total = $337,500 per year (50 x 10 projects/yr x $675)

Manpower Savings:
GS12 project manager @ $25.50/hr (base rate)
Estimate project overhead reduction of 20 hours per project through the use of on-line design coordination – eliminating the need to distribute multiple sets of design documents, collate review comments and transmit review comments to the designer. (50 x 10 projects/yr x 20 hrs/project x $25.50/hr project manager)
Total = $255,000

Total Estimated Cost Savings: $592,000 per year. B/C ratio = 3.95/1 (2 years)

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?
unknown

Are hardware or software upgrades required?

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
Framework Technology, Cubis Corporation, and Bluel

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.005

TITLE: A/E GIS and CADD Deliverables Standards Update

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
The Center's Architect-Engineer (A/E) CADD and GIS Deliverables Standards which were completed in 1995 and 1996, respectively, are out-of-date and require updating.

JUSTIFICATION:
The A/E CADD and GIS Deliverables Standards provide the guidance and sample contract language required by organizations contracting for CADD and GIS services.

APPROACH:
The updates would be accomplished by The CADD/GIS Center, with assistance from a small group of technical experts.

COST:
$ 25K

PRODUCT:
Two technical reports. (Both hardcopy and on-line.)

CUSTOMERS:
All organizations who contract for CADD and GIS services.

REMARKS:
None entered

PROJECT #: 01.005
TITLE: A/E GIS and CADD Deliverables Standards Update – Page 2

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 25 installations
Corps - 60 district offices
Navy - 30 installations
Air Force - 20 installations
Other Agencies - 5 installations

What is the measurable time or cost savings with the implementation/use of this product?
Hours for Engineer/Contract Specialist to develop and write contract language for CADD/GIS deliverables. 60 hrs

60 hrs x $60.00/hr = $3,600.00

$3,600 x 140 installation/offices = $504,000.00

B/C ratio = 10/1.

What, if any, non-quantifiable benefits will be realized?

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

PROJECT #: 01.005
TITLE: A/E GIS and CADD Deliverables Standards Update – Page 3

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.006

TITLE: Underground Utility Location on Existing Digital Maps

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Fort Knox currently has approximately 400 "E" size Mylar base maps at a scale of 1:500 with a .5 meter contour interval. These maps are in both Microstation and AutoCad formats based on Tri-Service Spatial Data Standards version 1.4. We need to expand these base maps into accurate utility maps in GIS format by using both digital and hard copy maps. We have been utilizing Intergraph GIS software to manage the data. When completed, utility maps will be used by Engineering Services for design, Operations and Maintenance for field location and maintenance, Fire Preventation and Protection for emergencies, Environmental Management and Planning. The ultimate goal is to have these maps accessible from desktop computers via the Fort Knox local network.

JUSTIFICATION:
In order to meet TRADOC safety standards, Fort Knox's must have accurate maps of their natural gas pipeline system, which is not currently the case. Placement of the Base Map with utilities on the local network will allow all organizations at Fort Knox to benefit from this valuable tool and reduce duplication of effort. The main emphasis at this point is to locate natural gas pipelines and shut-off valves, so that lines can be shut down in case of fire or other emergencies.

APPROACH:
* DBOS CADD section will gather existing digital and hard copy maps
* DBOS will provide digitized base maps of Fort Knox Cantonment Area
* DBOS will provide a CADD Workstation at Fort Knox
* DBOS will assist in field location of utility features

PROJECT #: 01.006
TITLE: Underground Utility Location on Existing Digital Maps – Page 2

* GIS-trained person/group will draw/load into GIS system
* Make this information available to local network

COST:
Based on work done in the past, putting Fort Knox's utilities in GIS format is an approximately $500,000 undertaking. Starting with the natural gas pipeline in FY01, assistance in mapping utilities for five years would be great

PRODUCT:
Final product would be all Fort Knox's accurate utility location maps accessible through the local network

CUSTOMERS:
Engineering Services Division
Operations and Maintenance Division
Supply and Storage Division
Fire Prevention and Protection Division
Housing Division
Environmental Management Division
Planning Division
Transportation Division
Directorate of Contracting
Law Enforcement Command
All Military Organizations
Range Division

REMARKS:
Current GDS office hardware and software:

* File Server
Hardware: 1996, Intergraph ISMP 630, Dual 200 MHz Pentium Pro. NT Server 4.0, (3)4GB hard drives-2GB on "C" drive (factory Configured)-6GB divided into 3 NTFS partitions, (1)9GB hard drive, RAID-8, 8X-CD, 128MB RAM, 14" monitor

* Work Stations- (2)Level 2 and (1)Level 3

In 1998, a small amount of work has been done to cleanup base maps, tag features, make network connections. Intergraph GIS software has been used to this point. Fort Knox management has made a commitment to get Fort Knox GIS operational and functional. To accomplish this, we need all the help we can get.

PROJECT #: 01.006
TITLE: Underground Utility Location on Existing Digital Maps – Page 3

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 10 installations
Corps - district offices
Navy - installations
Air Force - installations
Other Agencies - installations

What is the measurable time or cost savings with the implementation/use of this product?
Save one-half man year for CADD operator, he will not have to pull and copy drawings from various requesters. Map users will be able to access needs via the local network.

What, if any, non-quantifiable benefits will be realized?
Better products will be produced because better information is being utilized. Utility operations will be more efficient.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?

Are hardware or software upgrades required?
Yes

If yes, at what cost per workstation and/or user?
$5,000

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

PROJECT #: 01.006
TITLE: Underground Utility Location on Existing Digital Maps – Page 4

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.007

TITLE: Airfield Management - 3-D Imaging Capability

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
This proposal would create standards for a graphic display of obstructions penetrating an airfield glidepath and safety envelope.

JUSTIFICATION:
This product would create a visual representation of airfield obstructions. It will be useful to everyone using airfields, from pilots who will be able to view airfield obstructions from every angle of approach; to airfield planners who will be able to visualize the impact of obstructions and work to reduce or minimize the hazards as well as prioritize effort to reduce the most serious hazards; to airfield managers who need to understand all safety aspects of airfield operation, to regulators who need to evealuate waivers to airfield operations. The product can also be used to analyze future construction in the airfield vicinity and eliminate penetration of the airfield safety envelope. A visual/graphical representation of the airfield will universally assist in raising attention and awareness of everyone involved with airfield operation and use.

APPROACH:
Develop standards and a model for graphically displaying obstructions in the vicinity of an airfield that penetrate the airfield's glide path and safety envelope. The model should be built on existing COTS programs such as Airfield, Obstruction and Waiver Program, developed by Higganbotham, Briggs & Associates, Three-dimensional Arispace Analysis Programs (3DAAP), developed by Planning Technology, Inc., and Dames and Moore Group, etc. The model should be built on a standard three-dimensional map of the airfield and its vicinity. The safety envelope of the airfield would be superimposed on the map. The shape and top elevations of natural and

man-made objects and structures that penetrate the planes of the safety envelope would be added from a database such that they could be graphically displayed on an image of the airfield. Most of the elements for this graphic image have already been developed using Commercial Off the Shelf (COTS) software, and databases have been, or are being, developed from other CADD/GIS Technology Center projects. This proposal will create CADD/GIS standards.

COST:
$110K

PRODUCT:
Standards to be used with COTS software, such as the 3DAAP or OBIWAN product. This proposal suggests that COTS software should be evaluated and standards written for combining 3D imaging with existing CADD obstruction databases, to create a three dimensional image of an airfield, its glidepath and safety envelope, and obstructions that penetrate that glidepath and safety envelope.

CUSTOMERS:
All users, managers, and regulators of airfields would be direct users of the product. Pilots would use the product to visualize the takeoff and approach hazards they need to avoid. Managers and regulators would use the product to visualize airfield hazards and minimize their impact on operations. Planners would use the product to prevent future hazards and eliminate or reduce the impact of existing hazards.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - yes installations
Corps - no district offices
Navy - yes installations
Air Force - yes installations
Other Agencies - commercial airports, FAA installations

What is the measurable time or cost savings with the implementation/use of this product?
Visualization of hazards improves understanding of a list of database elements which can list but not show the direct impact of airfield hazards. The time taken to evaluate and analyze a database would be reduced by at least an order of magnitude with a visual representation.

What, if any, non-quantifiable benefits will be realized?
This product will improve airfield safety awareness.

PROJECT #: 01.007
TITLE: Airfield Management - 3-D Imaging Capability – Page 3

Are commercial-off-the-shelf alternative products available?
Yes

If yes, what products?
3DAAP - Planning Technology, Inc, and Dames and Moore Group
Airfield, Obstruction and Waiver, Higganbotham, Briggs & Associates

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?
Minimal training for everyone who would use it.

Are hardware or software upgrades required?
Yes

If yes, at what cost per workstation and/or user?
Depends on what is already available at a workstation

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
3DAAP

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.008

TITLE: Development of Geodetic Conversion Routines

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
In CADD, GIS, surveying, and engineering support environments, there are recurring routine needs to perform geodetic coordinate data conversions from one coordinate system to another coordinate system and from one datum to another.

This capability is well supported within commercial CADD/GIS packages, such as MGE, for converting graphic map files. This capability is also supported by the USACE, in a black box manner, via their software package called CORPSCON. CORPSCON allows key-in or bulk file-based geodetic coordinate system conversion between numerous grid and geodetic systems and datum.

However, there is no equivalent and standard set of programming library functions or dynamic link libraries (DLLs) available to those same offices to perform the similar geodetic data conversions when they must be accomplished by a custom-built programming application. I propose that such a standard set of geodetic programming functions be developed in FY 2001.

JUSTIFICATION:
One outgrowth is this unsatisfied requirement is that technical offices have had to develop a hodge-podge of "home built' functions to perform these task coordinate conversions. A standardized set of conversion functions will enhance the reliability and consistency of all CADD/GIS Technology Center member agency's geodetic programming efforts.

A published multiple language set of coordinate conversion library functions will result in a leap in efficiency in technical support offices by allowing the development of numerous special CADD/GIS/Surveying programming support tools.

PROJECT #: 01.008
TITLE: Development of Geodetic Conversion Routines – Page 2

APPROACH:
Perform an initial literature search for available source code suitable for standardization. Most probable agencies are USACE Topographic Engineering Center for CORPSCON source, the NGS, EROS, USGS, NOAA, and NIMA.

Suggested Resources:
The USGS General Cartographic Transformation Package (GCTP) located at
ftp://edcftp.cr.usgs.gov/pub/software/gctpc/

The PROJ.4 cartographic projection system located at:
http://kai.er.usgs.gov/ftp/index.html

MUSE package from NIMA.
http://www.nima.mil/geospatial/SW_TOOLS/NIMAMUSE
Datum Transformation & Coordinate Conversion, Version 4.1 (DTCC4.1)
http://164.214.2.59/geospatial/SW_TOOLS/NIMAMUSE/doc/apps/dtcc4/dtcc4.htm

NADTRAN transformation package.

Technically evaluate available source code for accuracy, flexibility, and ease of repurposing into a new tool. Convert the best available source code into sets of standardizing function calls and/or objects.

The most viable agency for partnering is the USACE Topographic Engineering Center as they have developed and distribute the CORPSCON program.

COST:
4 days: Research, Literature Search, Coordinating & Contacting Agencies
10 days: Technical Evaluation of existing conversion routines or algorithms
45 days: Conversion of existing conversion routines or new algorithms into standard function libraries for Microsoft Visual Basic, MicroStation MDL, FORTRAN, and generic C/C++ programming environments.
5 days: Development of software documentation
3 days: Contingency
3 days: CADD Center Administration
---
70 days

70 days at ~$650/day technical support = $45,500 Estimated Total Technical Labor Cost
Estimated Total Project Cost (Including Overhead) = $50,000.

PROJECT #: 01.008
TITLE: Development of Geodetic Conversion Routines – Page 3

PRODUCT:
Software: The project product would be sets of programming library routines supporting multiple languages and platforms. They would provide a standardized set of black box data conversion functions.

Targeted code development for commonly used Microsoft Visual Basic, MicroStation MDL, FORTRAN, and generic C/C++ programming environments.

Report: The software would be accompanied with a Programmer's documentation manual.

CUSTOMERS:
CADD Center agencies, USACE Laboratories, Districts and support contractors would have immediate need for these products

REMARKS:
41 Corps offices could use this product and all laboraties would have a requirement
(assume ½ of USACE FOAs perform some software development)

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Government Contractors – 100 offices
Other Agencies - t.b.d. installations

What is the measurable time or cost savings with the implementation/use of this product?
The code development for up to five commonly used Microsoft Visual Basic, MicroStation MDL, FORTRAN, and generic C/C++ programming environments will cost $19,500.

Each instance of an individual office developing code independently could cost the following, per instance:

2 days: Research, Literature Search, Coordinating & Contacting Agencies
2 days: Technical Evaluation of existing conversion routines or algorithms
3 days: Conversion of existing conversion routines or new algorithms into needed programming code.
---
7 days

7 days at ~$650/day technical support = $4,550 Est. Cost, per instance

PROJECT #: 01.008
TITLE: Development of Geodetic Conversion Routines – Page 4

Assume 50% of Corps District Offices and 25% of Army, Navy, and Air Force installations use the product, the total cost savings would be:

Corps – 21 x $4,550 = $ 95,550.00
Army, Navy, & Air Force – 75 x $4,550 = $341,250.00

Estimated Total Savings = $436,800.00

B/C ratio = 8.7/1

What, if any, non-quantifiable benefits will be realized?
Publishing of new technical code will magnify the CADD Center's influence and give value to new CADD Center customers.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes, the USGS, NGS, NIMA, and EROS published code is a basis for this work.

If yes, what?
Corpscon

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.009

TITLE: Multi-Agency Data Contract Coordination

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
There is a requirement to create a small, rapid acting contract vehicle to negotiate optimum GIS data and software prices and site licenses in direct support of the CADD/GIS Technology Center's supporting agencies.

JUSTIFICATION:
In GIS and engineering support environments, there are routine project needs to purchase value-added USGS data, satellite imagery, LIDAR, and other private sector provided mapping data. There is also a need to buy new software products that support this environment. These products are generally expensive or support unique narrow markets and may not be supported on existing government purchase contracts.

This requirement can be quickly supported by the shear number of firms that have come into existence to market repackaged USGS data and other value-added data products.

APPROACH:
Perform an initial requirements analysis across CADD/GIS Technology Center's supporting agencies for commercially supplied data needs and GIS-support software needs. Then negotiate the most favorable prices for this data and software.

COST:
60 days: Research, Literature Search, Coordinating & Contacting Agencies
30 days: Contract development and award costs.
---
90 days

PROJECT #: 01.009
TITLE: Multi-Agency Data Contract Coordination – Page 2

90 days at ~$650/day technical support = $58,500 Estimated Total Cost

PRODUCT:
Contract vehicle(s) for most favorable data and software license pricing.

CUSTOMERS:
All CADD/GIS Center agencies, USACE Laboratories, Districts and support contractors would have immediate need for these products.

REMARKS:
All Corps offices could use this product and all laborities would have a requirement.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - installations
Corps - 40 district offices
Navy - installations
Air Force - installations
Other Agencies - t.b.d. installations

What is the measurable time or cost savings with the implementation/use of this product?
Government Studies leading to Exec Order 12906, Geospatial Data reporting, found the Corps of Engineers to be one of the larger generators of electronic geospatial data. Generalizing, ~40 Corps FOAs spending $200,000 annually in aerial photography, LIDAR, space imagery collectively have $8,000,000 in spending power. A 5% savings due to shared contracts, quantity discounts, and improved coordination is $400,000 annual cost reductions within the Corps alone.

Estimate $50,000 startup cost for Proposal and cost recovery for administration will give a B/C ratio = 8/1.

What, if any, non-quantifiable benefits will be realized?

Are commercial-off-the-shelf alternative products available?
Yes

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

PROJECT #: 01.009
TITLE: Multi-Agency Data Contract Coordination – Page 3

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
GAS pricing NAVFAC, NAVAIR, NAVSEA

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.010

TITLE: Simplification of File Conversion Process

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
The implementation of A/E/C CADD Standard often requires conversion/translation of existing design files (e.g. base maps) from the outdated EM 1110-1-1807 30 Jul 90 CADD Standards. The objective of this project would be develop lookup tables and software scripts to simplify and expedite the conversion/translation of existing files from the old standard to the new one.

JUSTIFICATION:
The major benefit of this project will be to provide an application tool that will assist organizations that are implementing the A/E/C CADD Standard convert existing files when needed.

APPROACH:
Review various existing files, determine translation problems and issues, develop lookup tables and software scripts, etc. There may be partnering opportunities available with other agencies or groups with large numbers of existing files that are repeatedly used such as base maps of authorized projects.

COST:
$20K

PRODUCT:
A fully developed and tested application that would aid in the conversion of files from the old standard to the new.

PROJECT #: 01.010
TITLE: Simplification of File Conversion Process – Page 2

CUSTOMERS:
Multiple Corps Districts that have not fully implemented the A/E/C CADD Standard for a variety of reasons. Possibly other agencies and future users of the standards.

REMARKS:
A fully developed application that would assist an average (not a CADD or programming expert) convert existing files to the A/E/C CADD Standard would help organizations fully adopt the standards.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 15 installations
Corps - 10 district offices
Navy - 5 installations
Air Force - 5 installations
Other Agencies - 5 installations

What is the measurable time or cost savings with the implementation/use of this product?
Any simplification of the conversion process would create substantial time/cost savings.
160 hours x $65/hr = $10,400.00 x 30 installations = $312,000.00 B/C ratio = 15.6/1

What, if any, non-quantifiable benefits will be realized?
Help move toward one CADD standard.

Are commercial-off-the-shelf alternative products available?
Yes

If yes, what products?
Translation software- but they need simplification

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?
unknown

PROJECT #: 01.010
TITLE: Simplification of File Conversion Process – Page 3

Are hardware or software upgrades required?
Yes

If yes, at what cost per workstation and/or user?
unknown

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.011

TITLE: Translation of A/E/C CADD Standard into German

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
The A/E/C CADD Standard will be translated into German and one-time training will be provided to German government construction agencies and military service designers to promote use of the new standard.

JUSTIFICATION:
Having the A/E/C CADD standard in the German language will enable the Army and Air Force to receive designs and products in a standard format. With this standard man-hours will be saved in services not having to modify designs to a uniform format.

APPROACH:
Component 1 – Review existing A/E/C CADD standard to ensure its accuracy. Translate the A/E/C CADD standard from English to German.

Component 2 – Conduct a one time training/marketing session with the German government to make sure the standard is clear and understood.

COST:
$95,000 is the estimated cost for the entire effort, comprising $80,000 for the actual translation and another $15,000 for training/marketing.

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TITLE: Translation of A/E/C CADD Standard into German – Page 2

PRODUCT:
The final product will be the A/E/C CADD standard in the German language in both a hard copy and in electronic format. Also, a training session will be conducted in German explaining the standard.

CUSTOMERS:
Direct: German "Bauamts" and host nation design firms working under contract to them, Corps of Engineers personnel preparing designs for Army and Air Force customers, host nation engineering design personnel working at the Directorate of Public Works or Base Civil Engineer organizations.

Indirect: USAREUR, USAFE, EUCOM and NATO

REMARKS:
None.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 25 installations installations
Corps - 1 district office district offices
Navy - 0 installations
Air Force - 6 installations (estimated) installations
Other Agencies - 15 Bauamts installations

What is the measurable time or cost savings with the implementation/use of this product?

What, if any, non-quantifiable benefits will be realized?
Extensive benefits will be derived from having a single standard by which designs that are prepared by the "Bauamts" (German agencies that perform design work for the U.S. Forces). Right now, the current standard does not exist in German. The U.S. Forces could specify a standard if one existed that had the ability to be used by host nation design firms that the Bauamts contract work out to. Future design costs should be reduced, as as-built designs will be available in a standard form.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

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Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?
5-20

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
The English version is used on a limited basis.

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.012

TITLE: Continued and Future Development of MTMCTEA's GIS Databases and GIS Web Site

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
MTMCTEA's GIS Team is collecting the necessary information on OCONUS and CONUS networks (road and rail), ports and installations to build a central data repository of geographic data. Currently these databases provide input to the agency's deployment models and simulations such as ELIST, TRANSCAP and PORTSIM, all of which support DOD strategic transportation deployment analyses. Future capability, via the Web, will allow these databases to be disseminated among the military community, and ultimately will provide interagency capability within other models (ie. GCCS/GCSS).

JUSTIFICATION:
MTMCTEA's GIS mission is to provide MTMC, TRANSCOM and the DOD community with the expertise for evaluating the deployment capability of world highway and railway networks linking installations and depots to their seaport or airport of embarkation/debarkation or other intermodal transfer points to meet the time-phased transportation requirements of OPLANS, CONPLANs, and peacetime operations. TEA receives requests for GIS data and analyses under very short deadlines. The port, installation and networks for these request are needed quickly and with as much accuracy as possible. More accurate data, coupled with a DII COE compliant, Web-based delivery system, will allow TEA to supply our internal and external customers the necessary data to perform fast paced analyses.

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TITLE: Continued and Future Development of MTMCTEA's GIS Databases and GIS Web Site – Page 2

APPROACH:
Component 1: Purchase the necessary GIS software/hardware/data to allow TEA to effectively build more accurate databases and to obtain the required components to deliver these database, via the Web, to the DOD community.

Component 2: Obtain the necessary contractor support to implement, modify and/or enhance the Web services.

Component 3: Obtain the necessary support to maintain and update the GIS databases and software.

COST:
Total Project Cost - $300K

Multi-Year Project Cost breakdown:
Year 1: ($100K) - Component 1 (60%), Component 2 (40%)
Year 2: ($100K) - Component 1 (40%), Component 2 (30%), Component 3(30%)
Year 3: ($100K) - Component 3 (100%)

MTMCTEA will initiate a Program Objective Memorandum (POM) to secure Component 3 after Year 3.

PRODUCT:
The final product will be a user/browser friendly application capable of providing end-users the ability to review, analyze and download geographic data and production quality maps of selected regions of interest. The end product will furnish the tools and data to conduct analyses for contingency execution, deployment planning, stability support operations, exercises and other mission and interagency requirements. Additionally, the product will allow MTMCTEA to more effectively tap into other agencies' resources and share data by utilizing DII COE compliant software. This in turn helps to develop interagency standards and to consolidate application development efforts.

CUSTOMERS:
MTMC, TRANSCOM, CINCs, CIA, DIA, NIMA, JICTRANS, & JWAC

REMARKS:
The magnitude of this project will require it to carry over into future fiscal years. It will be necessary to implement a process to constantly update the geographic databases as more accurate information becomes available, as requirements change, and as technology continues to advance.

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Additionally, this project will ensure that the end-product conforms to DOD policy mandating that all information systems only utilize those mobile code technologies that pose limited or no risk to DOD systems (ie. Category 3 – JavaScript, VBScript, PDF, and Shockwave)

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
MTMCTEA, MTMC, and TRANSCOM "war fighting" missions

What is the measurable time or cost savings with the implementation/use of this product?
Quantifiable after Initial Operating Capability (IOC) which is to occur between year 1 & 2 of the project. Estimated period of Return on Investment (ROI) less than 1 year after IOC.

What, if any, non-quantifiable benefits will be realized?
Geographic data, maps and analytical capabilities can be easily shared between agencies.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No
If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.013

TITLE: Adding One-Door to the Corps Policy to the EBS Web System

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REQUIREMENT AND OBJECTIVES:
Presently a Contractor has to work his way through 40 different District web sites to find out if there is something for him to bid on. The objective of implementing One Door to the Corps Policy to the EBS web system will provide a Contractor or Supplier a listing of specific projects that can use his product.

JUSTIFICATION:
Benefiting from the One Door to the Corps will bring open completion for materials and supplies nationally and even internationally.

APPROACH:
a. WES- Review existing EBS systems and identify which elements would best be upgraded. Then proceed with the upgrades and provide documentation.

b. COE-NWK-EC-DC- Provide real EBS Projects and test the system as a user.

COST:
TOTAL = $95K

Breakdown:
$70K (Design)
$25K (Testing, Management)

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PRODUCT:
As a final product, a Contractor or Supplier will need to go to only one site to determine which Districts have a project the Contractor can bid on. WES will provide the Districts Manuals for the operation.

CUSTOMERS:
Direct users: Contractors & Suppliers
Indirect users: USACE to update database information

REMARKS:
None

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 0 installations
Corps - 40 district offices
Navy - 0 installations
Air Force - 0 installations
Other Agencies - 0 installations

What is the measurable time or cost savings with the implementation/use of this product?
The Kansas City District does about $150 million dollars worth of construction per Fiscal Year.

45% to 55% of Contract Cost is for materials.

Open market bidding will provide a maximum of 10% to a minimum of 2% cost savings in materials.

The Kansas City District can save an estimated 2% of 45% of $150 million, which equals $1,350,000.00

There are 40 Districts. Projected savings for 40 Districts could approach $54 Million.

B/C ratio = ($54,000,000) / $95,000 = 568/1

What, if any, non-quantifiable benefits will be realized?

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

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Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?
1

Are hardware or software upgrades required?

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.014

TITLE: Use Extensible Markup Language (XML) for the Electronic Bid Solicitation (EBS)

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REQUIREMENT AND OBJECTIVES:
Extensible Markup Language (XML) is the universal format for data on the Web. XML allows developers to easily describe and deliver rich, structured data from any application in a standard consistent way. XML does not replace HTML, rather, it is a complementary format.

Extensible Markup Language (XML) is a meta-markup language that provides a format for describing structured data. This facilitates more precise declarations of content and more meaningful search results across multiple platforms. In addition, XML will enable a new generation of Web-based data viewing and manipulation applications.

JUSTIFICATION:
XML brings so much power and flexibility to Web-based applications that it provides a number of compelling benefits to developers and users:

More meaningful searches
Development of flexible Web applications
Data integration from disparate sources
Data from multiple applications
Local computation and manipulation of data
Multiple views on the data
Granular updates
Delivery of data on the Web
Scalability
Compression
Open standards

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APPROACH:
a. WES- Review existing EBS systems and identify which elements would best be upgraded. Then proceed with the upgrades and provide documentation.

b. CE-NWK-EC-DC- Provide real EBS Projects and test the system as a user.

COST:
WES= $40K
CENWK-ECDC= $30K
TOTAL = $70K (Funded by WES)

PRODUCT:
As a final product for each component is a faster delivery of data on the Web system. Manuals for the operation.

CUSTOMERS:
Direct: USACE Employees and Contractors

REMARKS:
None

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 0 installations
Corps - 40 district offices
Navy - 0 installations
Air Force - 0 installations
Other Agencies - 0 installations

What is the measurable time or cost savings with the implementation/use of this product?
Assume a site is posting a standard EBS project. It takes about four hours to set up all the data file links.

Assume it takes a GS11 at $61 per hour times ten hours equals $610 per projects using the existing system.

The new web page system being able to create the links will take only one hour max at a cost of $61 per project.

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Now assume

20 projects/year times ($610 - $61) times 40 district offices = $439,200.00/year

B/C ratio = $439,200/$70,000 = 6.27/1

What, if any, non-quantifiable benefits will be realized?

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.015

TITLE: As-Built Digital Library with Web Access

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
As-Built drawings in either paper or mylar deteriorate over time and require expensive floor space to store. Locating drawings for future review or incorporation into new projects is cumbersome and time consuming. Scanning and cataloging drawings into a web based archival system, allowing for Intranet personnel full access, will permit faster and easier retrieval of information.

JUSTIFICATION:
The time required to continually maintain as-built hard copy drawings and creat mylar copies can be reduced appoximately 7 hours per design package, annually. Utilizing a digital library will reduce the respoduction time approximately 5 hours.

APPROACH:
Review existing methods used to retrieve information, i.e. building number, location, type of drawing. Create a database allowing such methods to be formulated into a SQL query. Design a data entry system for entering drawing information into the database. Devise a directory structure and file naming convention for storing the scanned drawings. Outline the steps in a SOP for scanning the drawings, inputting the data into the database, and then storing the file in the appropriate directory.

COST:
Approximate cost is $100K for software development and documentation. This does not include software for scanning drawings or housing the web site.

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TITLE: As-Built Digital Library with Web Access – Page 2

PRODUCT:
Deliverables for this project includes:
- A SOP outlining all aspects of the process.
- Administration documentation defining the database and web page interaction.
- Active Server Pages (ASP) which will be used to query the information and displaying the
- As-Built on the user's screen via a web browser.
- Microsoft Access database.

CUSTOMERS:
All federal and non-federal agencies involved in the production and receipt of engineering drawings.

REMARKS:
The actually design of the software uses well know techniques and is straightforward. Defining what information is to be stored in the database is what will cause the most controversy. It is a fine line between not-enough/too-much information to be entered per drawing.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army – 75 installations
Corps – 41 district offices
Navy – 42 installations
Air Force – 60 installations
Army National Guard – 142 installations

What is the measurable time or cost savings with the implementation/use of this product?
It is dependent on the number of and size of design packages. For an average size project, the estimated timesavings is 60 hours. The actual saving is hard to measure since users who never had access to such information now will be able to. BC ratio is 0.04% to 1.

What, if any, non-quantifiable benefits will be realized?

Are commercial-off-the-shelf alternative products available?
No commercial products are available that perform this particular function.

If yes, what products?

Does the project conform to current technology?
The project utilizes the latest technology in serving up information via the web.

Does the project identify well-defined stages of development with clear completion points?
A timeline could be created to show completion points.

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Is training required for the product?
No, documentation will be provided describing each step in the process.

If yes, how many people per agency?

Are hardware or software upgrades required?
Hardware and software requirements will vary from installation to installation. Most will have the need computer hardware and software. A scanner large enough to scan drawings may need to be purchased or a BPA be written with a local contractor.

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
It is unlikely that any commercial product will provide the functionality of this product.

Is there anything similar currently in use?
The CADD Library at ITL is similar in that it stores Electronic Bid Solicitations in a digital format, allowing users to retrieve drawings via the web.

If yes, what?

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.016

TITLE: Expand SDSFIE/FMSFIE to Capture Additional Environmental Data Sets to Meet Federal, State, and Local Environmental Regulations and Reporting Requirements

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Both state and military installations are required to collect, manage and report vast quantities of environmental data. Most environmental departments are using standalone databases, spreadsheets, and paper files to manage these data. A centralized, SDSFIE/FMSFIE-compliant environmental database schema is needed. The objective of this project is to evaluate existing environmental databases, determine the overlap with SDSFIE/FMSFIE, and develop a revised SDSFIE/FMSFIE schema that will include all or most environmental data.

JUSTIFICATION:
Most environmental data is spatially-related. And yet, environmental off-the-shelf database systems are not GIS focused. Environmental staff may be managing similar data in different places for different purposes. This results in the need to import/export data between systems to do reporting, mapping, or other functions. It also results in redundant data entry because of the many disparate systems in use. The development of a consolidated system based on the CAD/GIS technology center spatial data standards would eliminate redundant data entry, facilitate access to data, and ensure data quality. Also, installations could develop their own GIS-based interface using existing tools (e.g., ArcView).

APPROACH:
1. The current SDSFIE/FMSFIE schema does not contain the majority of the data (primarily environmental compliance, e.g., air and solid waste) needed for environmental reporting and recordkeeping. The first step is to compare current SDSFIE/FMSFIE tables and columns to some standard environmental database schemas (such as the data model published by EPA, other models to be determined). Identify new columns and tables that will be added to

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SDSFIE/FMSFIE as well as any modifications to SDSFIE/FMSFIE. Minimize changes to existing columns.
2. Determine relationships between tables, and create entity relationship diagram.
3. Write scripts to generate revised SDSFIE/FMSFIE schema.
4. Prepare documentation.

COST:
6-10 person months, or .5 -- .75 Manyear.
Technical Labor Cost = $75K
Total Project Cost (including Environmental FUG participation) = $90K

PRODUCT:
Revised and expanded SDSFIE/FMSFIE database schema and scripts.

CUSTOMERS:
All environmental departments throughout DoD, and other Federal, State, and Local Governmental organizations.

REMARKS:
Federal, state, and local laws and regulations mandate recordkeeping requirements for environmental data. Failure to comply with these requirements can result in fines and public embarrassment. Therefore, building a more secure and efficient system will facilitate compliance and will inspire the confidence of regulators in any organizations environmental procedures.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Government Contractors - 100 offices
Other Agencies - installations

What is the measurable time or cost savings with the implementation/use of this product?
The primary cost savings will be a reduction in the labor required to update and manage the data, and to generate the required reports. Estimate a minimum 30% reduction in current labor requirements by:
a. Eliminating redundant data entry
b. Reducing need to import/export data between different systems (i.e., to do reporting)
c. Consolidating management of 8-15 individual data management systems to one

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This system will also leverage the cost already incurred for GIS software and training, and Oracle software and training at bases already using these technologies.

The typical annual cost for environment reporting and record keeping at each military installation is estimated to be $1,500K. This project is estimated to provide an annual savings of $450,000 per military installation and Corps District Office. B/C ratio = 1350/1

What, if any, non-quantifiable benefits will be realized?
The proposed database will provide numerous intangible benefits:

a. Better decision-making by making all data available to users via ArcView or other user friendly interface
b. Enabling spatial modeling and analysis of environmental data
c. Improved data integrity, security, backup procedures
d. Streamline the inspection and reporting process
e. Increase confidence of regulators in the recordkeeping

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

PROJECT #: 01.016
TITLE: Expand SDSFIE/FMSFIE to Capture Additional Environmental Data Sets to Meet Federal, State, and Local Environmental Regulations and Reporting Requirements – Page 4

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.017

TITLE: Digital GeoLibrary Implementation Strategy Analysis for Military Natural & Cultural Resource Programs

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
The GIS/CADD technologies industry is placing increasing emphasis on facilitating rapid and easy access to all information available about the earth relevant to user defined needs. Several projects are in process that address some, but rarely all, the need of military natural and cultural resource georeferenced data mangers. A requirement exists for digital geolibrary guidance to all personal charged with managing, using, and sharing geospatial data for mission driven land management decision-making.

The studies' objectives are twofold: 1) The project will evaluate existing strategies based on key criteria identified such as data organization, security, and structure, scalability, query methodologies, geocoding strategies, administration, and inter- and intra-net integration. 2) The project will identify commonalities in the evaluated strategies and provide definitive guidance on digital geolibrary implementation for military natural and cultural resource programs.

JUSTIFICATION:
This project, if approved, will provide a customer oriented digital geolibrary needs assessment, an objective and comprehensive evaluation of existing digital geolibray implementation strategies, and a guidance document on implementing a digital library based on a classification of existing programs. The products of this study will provide an invaluable tool to natural and cultural resource programs at all management levels. When applied in practice, the information provided by this study will ensure better-supported decision making though ease and efficiency of access to georeferenced data; a digital infrastructure for data sharing and application development, and a standardized environment to populate with SDSFIE-defined data.

PROJECT #: 01.017
TITLE: Digital GeoLibrary Implementation Strategy Analysis for Military Natural & Cultural Resource Programs – Page 2

APPROACH:
The digital geolibrary implementation analysis study will approach the compilation, evaluation, and draft of a general digital geolibrary implementation strategy through the following steps:

1) Perform research of industry white papers, peer reviewed journal articles, and existing geolibrary implementation projects to develop evaluation draft criteria.
2) Identify and classify project customer representatives (natural and cultural resource geodata mangers), solicit geolibrary-oriented needs, and request feedback on draft criteria established in Step 1 using questionnaires.
3) Rework criteria based on Step 2 and evaluate existing geolibrary implementation projects.
4) Identify commonalities among top ranked implementation strategies.
5) Develop draft general digital geolibrary guidance document based on Step 4 and needs assessment from Step 2.
6) Distribute guidance document among customer representatives; request feedback.
7) Edit draft using feedback from Step 6.
8) Delivery final workflow/criteria, evaluation and guidance document.

COST:
The estimated cost of this project is $75,000.00.

PRODUCT:
This studies' final product includes workflow and criteria descriptions, geolibrary project evaluations, and a general digital geolibrary implementation strategy guidance document. The study will be formatted for 4-color publishing and be distributed on CD-ROM in PDF format

CUSTOMERS:
The primary customers of this project are military natural and cultural resource georeferenced data mangers, however the beneficiaries include all land and training management decision-makers.

REMARKS:
Although several information and research organizations (e.g. CERL LMS, SERDP, Geospatial R&D Program), as well many government contractors are establishing georeferenced data repository programs independently, none have provided the needs assessment, strategy evaluation, or general guidance document proposed by this study. Due to all the independent efforts noted above, a project of this scope is needed in a timely manner to reduce duplication of effort throughout the service branches and save federal funds.

PROJECT #: 01.017
TITLE: Digital GeoLibrary Implementation Strategy Analysis for Military Natural & Cultural Resource Programs – Page 3

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 75 installations
Corps - 41 district offices
Navy - 42 installations
Air Force - 60 installations
Other Agencies - 29 offices

What is the measurable time or cost savings with the implementation/use of this product?
The time saved is based on 1 GS-11, Step 1 and 1 GS-9, Step 1 employees working on an implementation plan for about 1 month solid multiplied by 247 installations = $1,660,828.00.
B/C ratio = 22/1

What, if any, non-quantifiable benefits will be realized?
The information provided by this study will ensure better-supported decision-making though ease and efficiency of access to georeferenced data; a digital infrastructure for data sharing and application development, and a standardized environment to populate with SDSFIE defined data across the DoD service branches.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

PROJECT #: 01.017
TITLE: Digital GeoLibrary Implementation Strategy Analysis for Military Natural & Cultural Resource Programs – Page 4

Is there anything similar currently in use?
Yes

If yes, what?
Several information and research organizations (e.g. CERL LMS, SERDP, Geospatial R&D Program) as well many government contractors are establishing georeferenced data repository programs but none have provided the needs assessment, strategy evaluation, or general guidance document proposed by this study.

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.018

TITLE: IFC Material Selections Specification and Procurement

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REQUIREMENT AND OBJECTIVES:
The Industry Foundation Class (IFC) Model will enable full life-cycle interoperability of soft-are used by all industry participants. One of the processes not yet supported by the model is the Material Selection-Specification-Procurement process. Although the generic IFC data structures allow any type of data to be incorporated, the static (predefined) IFCs do not include the detailed material property information necessary to perform the following tasks:

Selection of products (materials and equipment) from the universe of commercially available products.

Specification of products for competitive bidding.

Specification for purchasing by constructors.

Procurement management

The project work would consist of two principal tasks:
1) analysis of the integrated process of material selection, specification and procurement and its information transmission needs in the IFC model, and
2) design of IFC's to carry the information into the IFC model.

JUSTIFICATION:
Material specification, selection and procurement processes cross over all disciplines of architecture, engineering and construction. All the current software products that implement parts of these processes will benefit from an analysis of the overall process, and near-future IFC compattible software will seamlessly integrate specifications with all of the other poesses. At the micro level, individual applications should be able to use the analysis to improve their capabilities. At a slightly higher level, they should be able to more effectively exchange information with related applications. At the highest level, new software tools that utilize

standardized product information would improve the overall process, lessen the time required, and improve accuracy.

E-commerce would be greatly facilitated by this standardization. Purchasers would more easily find equivalent products, increasing competition and allowing smaller organizations to compete more effectively.

APPROACH:
The IAI PM Domain has started a project on Material Selection Specification and Procurement. The project proposed here will leverage this group of industry professionals and facilitate their work. Arcom and BSD have both committed to participate. Close collaboration will be coordinate with aecXML Working Groups for "Catalogs," "Procurement," "Design, Specification, Schedule, Cost" and with the IAI Libraries domain.

The Libraries domain is addressing the problem of product and building element classification in conjunction with the CSI. This work will also be coordinated with the Construction Specifications Institute's Integrated Information Initiative (III) project includes development of data that would be ideal for use in the portion of the model contemplated by this project. Progress on CSI's project would significantly reduce the time frame for this IAI project.

COST:
FY01: $25,000
FY02: $25,000
The cost will support 25% of a work year with associated travel and per deim. Other members of the IAI will contribute 100% of their cost to participate in the effort.

PRODUCT:
The project will produce the PM components for standard object library and models for Release 3.0.

CUSTOMERS:
The Release 3.0 object library will be used initially by software vendors. As they incorporate the library into their products, users will be those who purchase and use the software. Having standard objects in COTS software makes it difficult to precisely quantify users. The standard object library will be in CADD and PM and other types of software.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices

PROJECT #: 01.018
TITLE: IFC Material Selections Specification and Procurement – Page 3

Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

What is the measurable time or cost savings with the implementation/use of this product?
The standard objects developed to date have been shown to completly interoperate with no errors and dramaticlly reduce data conversion time between COTS software.

Assume 100,000 data conversions are performed per year by people that cost and average of $25 per hour. Assume that each data conversion, including verification, takes 1 hour when not using standard objects. We have seen that data conversions with standard objects take less than 5 minutes and produce no degredation in data content or quality. Therefore, the cost of the new technique would be at most 10% of the status quo cost or 100,000 * 25 * 10% $250,000. The cost savings will be at least $2,250,000. B/C ratio = 10/1 for FY01 and 10/1 for FY02.

What, if any, non-quantifiable benefits will be realized?
Standard objects will improve data quality of all supporting products.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

PROJECT #: 01.018
TITLE: IFC Material Selections Specification and Procurement – Page 3

Is there anything similar currently in use?
Yes

If yes, what?
COTS software supporting Release 1.5

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGHT THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.019

TITLE: Develop a Prototype Automated Work Management System for an Army Installation Utilizing Technology Deployed at Pax River Naval Station. Prototype will be site adapted at Fort Bragg, NC

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REQUIREMENT AND OBJECTIVES:
Develop an automated work management system which provides a "paperless" work flow for OMA construction projects. System will incorporate information currently stored in multiple databases that have no current connectivity such as IFS, CADD, GIS and local access databases. System products should be layered access to CADD/ GIS data, macro-level management query/reporting capability, electronic transferral of project files with multiple documents in various formats throughout the organization and electronic receipt/send capability for project information to and from customers.

JUSTIFICATION:
Current work management system is cumbersome and extremely limited in data sharing capability. Many manhours are wasted performing duplicate input of data into multiple automated systems that are not connected. Management level reporting is very costly due to requirement to manually extract data in raw form and manipulate it into a meaningful management tool. Paper project files must be manually routed throughout the organization for review/approvals due to lack of adequate electronic routing systems and the lack of centralized access to multiple layers of data such as CADD, GIS, and construction execution data. Many manhours are wasted in field verification of project scope/environmental impact because CADD and GIS systems are not connected to share data layers.

PROJECT #: 01.019
TITLE: Develop a Prototype Automated Work Management System for an Army Installation Utilizing Technology Deployed at Pax River Naval Station. Prototype will be site adapted at Fort Bragg, NC – Page 2

APPROACH:
Review current work methods and evaluate business processes that can be distributed across multiple army sites. Use existing data, where possible, to create corporate databases, for use base-wide, where input from users will not be duplicated and all applicaple data will be available for reporting purposes and creating work orders, plans, specifications and GIS systems. Use existing data and modifiy bussiness practices to create electronic work flow and distribute forms electronicly. Make use of existing developments created at other sites such as the Navy's Pax River Naval Station. Adapt this existing technology at an army site to be used as a proto-type and then distributed throught out army. Create WEB enabled viewing tools for informal data review of exisiting data, by combining existing data from distributed databases thruought out the site. Adapt existing technology from COTS software or software developed at other sites that will create a seamless electronic work flow that can be dispersed to other army bases.

COST:
$100,000.00

PRODUCT:
Software to integrate multiple systems and provide electronic routing/receipt of project files and management level reporting of data.

CUSTOMERS:
Direct customers: All entities within the PWBC.

Indirect customers: 130 customer organizations via internet/LAN.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Other Agencies - 100 installations

PROJECT #: 01.019
TITLE: Develop a Prototype Automated Work Management System for an Army Installation Utilizing Technology Deployed at Pax River Naval Station. Prototype will be site adapted at Fort Bragg, NC – Page 3

What is the measurable time or cost savings with the implementation/use of this product?
50 employees at each site using this technology
5 hours per week savings in time per employee
$50 per hour per employee
(50 x 5 x $50 x 52 weeks x 80 installations) = $52,000,000.00 savings
B/C ratio = 520/1

What, if any, non-quantifiable benefits will be realized?
More accurate reporting of data.
Better worker moral.
Workflow will be consistent across army bases.

Are commercial-off-the-shelf alternative products available?
No, but COTS software will be used in the development.

If yes, what products?
Databases, Drawing Review Packages, Office automation software

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes – minimual, could be done by CD-ROM, WEB, or document.

If yes, how many people per agency?
100

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

PROJECT #: 01.019
TITLE: Develop a Prototype Automated Work Management System for an Army Installation Utilizing Technology Deployed at Pax River Naval Station. Prototype will be site adapted at Fort Bragg, NC – Page 4

If yes, what?
Pax River Naval Station

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.020

TITLE: Web-enabled Project Control

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REQUIREMENT AND OBJECTIVES:
In the last year web-enabled construction project control systems proliferated and expanded dramatically in capabilities. The Government has a requirement to examine these tools and to determine if and how to use them. Mature and well known commercial products, such as Primavera's Expedition software and Meridian's Prolog systems are now web-enabled. Blueline Online's ProjectNet 3.0 (the company recently morphed into Cephren, Inc.) has found broad acceptance among progressive firms for project coordination. For example, HOK (reported to be the largest architectural consultant in the US) has adopted ProjectNet for their project control purposes. Bidcom and Constructw@re offer similar capabilities. Meridian also has a hand-held device (similar to a Palm Pilot) called the Prolog Pocket. It is designed to collect project information directly in the field and can be either uploaded or downloaded for Meridian's Prolog Manger 5.0.

The objective of this project is to examine Federal agency project control practices, clarify underlying requirements, and then compare these requirements to capabilities of the new breed of commercial offering.

Relationships to integrated project models and e-business will be outlined and recommendation for Federal agency use of the new products will be prepared. Finally a demonstration project will be executed using some of the commercial web-enabled technologies.

JUSTIFICATION:
In the fast moving field of information technology Federal Agencies have a need for an examination of the usefulness and applicability of new web-enabled project control systems.

PROJECT #: 01.020
TITLE: Web-enabled Project Control – Page 2

Consultants working for the Government are rapidly deploying these tools and are presuring their customers to join them in using tools that can communicate efficiently between project participants.

APPROACH:
Task 1: Survey the available commercial web-enabled project control systems and characterize their capabilities in a report for use by agencies.

Task 2: Review Federal agency project control practices (Center approved selection of agencies) and document fundamental requirements and common practices, including legacy software. Special attention will be paid to reviewing the potential and necessity to communicate between commercial web-enabled systems and legacy systems.

Task 3: Study the project control requirements in relation to new developments in e-business, XML schemas for the AEC+FM industry such as aecXML, integrated project modeling software (IFC-based). Recommend improved capabilities for project control based on these developments.

Task 4: Convene conference of vendors and selected agency personnel to present findings and compare agency needs with available capabilities. Make recommendations for modifications in vendor software, and publish report recommendation for improved project control using new technologies.

Task 5: Select an agency nominated project (small) for a project control demonstration of new technologies and recommended practices. The demonstration will likely be running in parallel with conventional systems. Final report, including final recommendations

COST:
FY01: $105,000
FY02: $40,000

PRODUCT:
1) Report for use by agencies to characterize the capabilities of available commercial web-enabled project control software.
2) Report to document fundamental requirements and common practices of agency project control, including legacy software.
3) A conference of vendors and selected agency personnel
4) Report with recommendations for modifications in vendor software, based on agency requirments
5) Report recommending improved project control using new technologies
6) Demonstration project and final report.

PROJECT #: 01.020
TITLE: Web-enabled Project Control – Page 3

CUSTOMERS:
All agencies performing design and construction project control.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices
Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

What is the measurable time or cost savings with the implementation/use of this product?
The products will consolidate Center and Corps operations to advance the body of knowledge in the area of technical web-based project control products. Estimate the cost saveings to be twice project cost or $290,000. FY01 B/C ratio = 2.762/1; FY02 = 7.25/1

What, if any, non-quantifiable benefits will be realized?
Standard objects will improve data quality of all supporting products.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

PROJECT #: 01.020
TITLE: Web-enabled Project Control – Page 4

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.021

TITLE: Interoperability Architecture for Life Cycle Facility Processes and Business Operations

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REQUIREMENT AND OBJECTIVES:
The need for close integration between the various elements of a facility design had long been recognized and had been the subject of study for many years, in DOD, academia as well as industry. Similarly the integrated nature of facilities management, operations and maintenance has been acknowledged in recent years, and the need to exchange information became a pressing goal. This recognition was in part responsible for the creation of the The CADD/GIS Technology Center, and the SDSFIE, A/E/C and FMSFIE standards it is promulgating. In industry this realization led to the formation of standards organizations such as ISO STEP, IAI, OGC and others. Good progress has been made in the last few years with standardization of data and contents in many diverse fields. Recently there have been dramatic developments of XML schemas and other e-commerce enablers.

The objective of this project is to assess and characterize the needs for data standards and interoperability of the main business and engineering processes needed for installation/base life cycle management. The scope will focus on the phases of facility design, project management, and facility management, and will identify data that must be shared and compare it to available data standards. The project will systematically identify areas of high priority for further standards development, with associated tools to put the standards to work effectively. Guidelines will be developed for the overall understanding of Center and other relevant standards, and explain how they (e.g. AEC, IAI, SDSFIE, OGIS) are related and complementing. The project will also develop an overall system architecture to show how implementation of the standards can be achieve in a practical way to accomplish an optimal degree of interoperability. The main software types used in the processes within project scope will be considered (i.e. CADD systems such as AutoCAD, Microstation, cost estimating systems such as Timberline or MCASES, project management systems such as Primavera, and government systems such as

PROMIS, and CAFM systems such as MAXIMO). Interoperability of such systems as they track the life cycle of a facility project and need to exchange data with legacy systems will be evaluated.

JUSTIFICATION:
Data standards hold the promise of increasing productivity, effectiveness, accuracy and timeliness through data exchange and interoperability. In addition to developing necessary standards the Center needs to develop the blueprint of how important government business processes can actually be satisfied and enhanced by using the appropriate standards, and how to realize this promise in practical COTS.

At the highest level data exchange and interoperability could allow us to answer important questions more accurately. For example questions about the installation's readiness, and what impact costs have on the success of the training mission can only be answered if data from many diverse sources can be integrated successfully. Such answers could be made possible by an effective, integrated life cycle management process for facilities needed for the 21st century. In order to achieve that, the facility design process must feed real data to an efficient facility management and maintenance system that is, in turn, part of a larger installation management system. Similarly the environmental and training land issues must be tied to the overall installation management. These systems further need to be able to abstract appropriate data and feed government legacy systems as well as exchanging information with industry, local government and other partners.

All of these capabilities depend on the ability of customers to operationally integrate the data standards the Center and other organization have been developing into better engineering and business processes. This process starts with the proposed assessment of how existing standards satisfy the most important processes of facility and installation management, and guidelines of how the standards can be used in practical systems to achieve interoperability.

APPROACH:
Task 1. Conduct a review to determine the high priority needs for data exchange and interoperability in facility life cycle management. Determine which needs are presently met and unmet by data standards. Review SDSFIE, A/E/C, FMSFIE, IAI, OGIS and other relevant standards to determine how the integrated operational needs can be satisfied with these diverse standards. Determine the relevant industry trends in computing that influence the large-scale implementation of interoperability. Identify the high priority, high pay-off areas where standards need to be strengthened.

Task 2. Develop system architecture for interoperability. This task will review the software systems mentioned above for interoperability and report the recommended practice of operationalizing the standards in business processes. It will also provide guidance in the

computing system architecture for achieving interoperability. Future workshops are anticipated to help installation plan and implement such systems, but that is not included in this proposal.

Task 3. Organize a workshop for selected software vendor to promote interoperable architecture. The objective is to persuade software vendors to deliver software that is compatible and interoperable, as well as enabling software products.

COST:
FY01: $145,000

PRODUCT:
1) A Center architecture for interoperability, guidelines to operationalize appropriate standards in business processes and recommendations on computer systems architectures to achieve interoperability.
2) Commercial software will become available to implement the standards and provide the integrated capabilities professionals and managers need.

CUSTOMERS:
1) All designers, planners and project managers, contractors and partners involved in facilities life-cycle management. They will benefit from guidelines to make the data standards work with they software to achieve interoperability.
2) The Center will benefit from a systematic study of how diverse internal and commercial standards will work to improve the customers' work flow and business processes. This project will also aid in setting priorities for future standards development. Most importantly, it will become a significant mode of technology transfer, as the Center provides help to customers to integrate standards into their work processes.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices
Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

What is the measurable time or cost savings with the implementation/use of this product?
The product will be a framework for other Center object products. Cost savings will be realized through effeciency in other Center projects and supporting software. Estimated savings to be $500,000 through a baseline for objects and more efficent project tools. B/C ratio = 3.45/1

PROJECT #: 01.021
TITLE: Interoperability Architecture for Life Cycle Facility Processes and Business Operations – Page 4

What, if any, non-quantifiable benefits will be realized?
Standard objects will improve data quality of all supporting products.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.022

TITLE: Inventory of COTS Engineering Software

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
The proliferation of commercially available software and the administration's policy to favor COTS software forces engineers to search for software that could meet their needs. There are also standards issues that interfer with interoperablity between software tools making them difficult to use together.

The objective of this project is to compile and maintain a list of COTS software for engineers and have this list available on the Web. The site would provide common Web site capabilities that will enable engineers to identify the software packages that should be considered to solve their automation needs.

JUSTIFICATION:
The magnitude of available COTS software packages is such that a busy engineer cannot maintain information about all the tools that could be considered when an automation need arises. Software capabilities are changing as rapidly as the market. An engineer is paid to solve engineering problems and good tools are a major component of the engineer's reputation. The web page service will be maintained by the Center and will include certifications that the tools hold. Other capabilities and categories will be included for rapid selection of software classifications.

APPROACH:
The project will grow a web site that will change over time to maintain a clearing house of COTS software for engineers.

PROJECT #: 01.022
TITLE: Inventory of COTS Engineering Software – Page 2

COST:
FY01: $40,000
FY02: $20,000
FY03: $20,000
FY04: $20,000
FY05: $20,000

PRODUCT:
A set of web pages on the CADD/GIS Center server to help engineers locate COTS software that meets their needs.

CUSTOMERS:
All agencies performing design, construction and FM.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices
Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

What is the measurable time or cost savings with the implementation/use of this product?
It is estimated that this project will save $250,000 in the time it takes engineers to search, analyze, decide, and purchase COTS software. B/C ratio for FY01 = 6.25/1; FY02 = 12.5/1; FY03 = 12.5/1; FY04 = 12.5/1; and FY05 = 12.5/1

What, if any, non-quantifiable benefits will be realized?
Getting correct software the first time will save time and cost to re-order another software package that better meets the needs of the engineer.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

PROJECT #: 01.022
TITLE: Inventory of COTS Engineering Software – Page 3

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.023

TITLE: Marine Corps World Wide Inventory of Existing Geographic Information Systems

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Development of a Marine Corps wide inventory of existing geographic information systems (GIS) and resources at each Marine Corps installation. The result of this study should assist Headquarters Marine Corps establish a base line for investment in GIS technology and applications. Some installations have significantly advanced the use of GIS within their business model. Other installations are still in the process of establishing their GIS systems and data. The final goal of this survey is to establish a strategic plan that would allow all Marine Corps installations to achieve the development and use of a base line GIS system with a nominal amount of spatial data and to establish a budgetary line item to move each installation on to the baseline system.

JUSTIFICATION:
Adaptation of GIS as a business improvement tool throughout the Marine Corps is not possible unless all installations are able to operate on a common baseline. Those installations currently represented on the Marine Corps GIS User's Group (MCGUG) are currently standardized in the use of the ESRI suite of GIS software products and applications. The lack of a common baseline for GIS at all installations makes it difficult for the Marine Corps to capitalize on the application and widest distribution and use of special applications available within the GIS. Similar to what the Headquarters Marine Corps Installation & Logistics Department, Facilities and Services Division's Facilities Integration web site has done to enable the field offices to access the Maintenance of Real Property (MRP) project status and funding information, a standardized baseline GIS model at each installation can be used to provide improved facility and environmental planning information to Headquarters Marine Corps.

PROJECT #: 01.023
TITLE: Marine Corps World Wide Inventory of Existing Geographic Information Systems – Page 2

APPROACH:
Through the use of a consultant familiar with the development and deployment of the spatial data standard for facilities, infratructure, and environment (SDSFIE) compliant GIS system, conduct a site survey at each of the Marine Corps facilities to obtain an inventory of each existing GIS and assess the integration/planned integration of the GIS into the installation's business model.

Inventory items include, but are not limited to:

a) Installation (and collocated or regional facilities serviced by another installation), mission, area covered (square mile), and number of system users/desktop.
b) Software and integration, to include but not limited to type of software, number of licenses, network architecture, and data storage system architecture and size.
c) Number of personnel assigned to GIS program, to include but not limited to full time positions, part time, personnel grades, working group personnel and other associated GIS management.
d) List of coverages (i.e., utility systems, real property, fauna, environmental, ortho photos, etc.).
e) Special applications developed or in use.
f) Investment summary (by project or coverage) and long term investment plans.
g) Participating installation using agencies and applications, to include but not limited to Provost Marshal Office, Fire Department, Telephone/ISMO (G-6), etc.
h) Overall determination of what constitutes a "baseline" installation GIS solution will require participation of Headquarters Marine Corps, the installations and the MCGUG. In general there are a common set of installation infrastructure data needed to support facility management, including:

- Buildings
- Streets/Parking lots/Open storage areas
- Utility systems:
  - Gas
  - Water
  - Sanitary Sewer
  - Communication/Data
  - Electrical
  - Cable Television
  - Steam/Chilled Water
  - Petroleum/Oils/Lubricant (POLs)
- Building floor plans.
- Other features as determined by additional discussions.

COST:
Estimated cost of project development is estimated at $100,000 based on a best guess estimate. Accuracy for this estimate is unknown.

PROJECT #: 01.023
TITLE: Marine Corps World Wide Inventory of Existing Geographic Information Systems – Page 3

This effort would be centrally funded by Headquarters Marine Corps.

PRODUCT:
Final product is to be a summary report by installation of the current status and deployment of their GIS program based on the survey data requirements, a summary of the overall Marine Corps investment, and a recommendation of future investment costs for each installation.

CUSTOMERS:
Direct and indirect customers include:
Headquarters Marine Corps, Marine Corps Installation Commanders and GIS Managers

REMARKS:
This effort is intended for the benefit of Headquarters Marine Corps and Marine Corps installations. Other Department of Defense installations may benefit by using this project as a template for their own baseline assessment.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - installations
Corps - district offices
Navy - installations
Air Force - installations
Other Agencies - 20 Marine Corps installations

What is the measurable time or cost savings with the implementation/use of this product?
The potential cost saving is unknown or not fully quantifiable at this time. Until such time as a minimum baseline GIS requirement is established and fielded at each installation the maximum cost savings can not be achieved by use of GIS in the Marine Corps. The highest potential cost savings can best be achieved when "lessons learned" from one installation or used to avoid costly errors or improve the usability or quality of the data collected.

What, if any, non-quantifiable benefits will be realized?
Non-quantified savings can be realized by exchanging project statements of work, identifying contractors with proven ability to accomplish the required GIS development with the least amount of overhead and supervision by the Government.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

PROJECT #: 01.023
TITLE: Marine Corps World Wide Inventory of Existing Geographic Information Systems – Page 4

Does the project conform to current technology?
No

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.024

TITLE: Document Tools for Producing and Publishing Engineering Documents

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Electronic Bid Solicitations (EBS) are the principal means of soliciting bids for construction with in the Corps. Numerous other government agencies and private sector companies have also adopted the EBS process. The primary short fall of the current EBS process is that the drawing production workflow does not utilize the information within the CADD drawings. This leads to the requirement of efficiently placing and utilizing data in CADD drawings to greatly enhance the EBS end product.

OBJECTIVE:
To produce tools that will aid engineers and architects in placing intelligent elements in CADD drawings and developing a post-processing program to interpret the placed element. This will eliminate the need for engineers and architects to manually set hyperlinks and scales. This will also promote the use of the Uniform Drafting System, which is a national effort supported by both the government and the private sector.

JUSTIFICATION:
The final EBS product (CD) is only being used as a delivery media. In most cases a CD is received by a contractor and they simply print the document and use the paper in traditional ways. The reason for this is that navigating and scaling an electronic set of drawings is not very efficient. Navigating and scaling drawings would be more efficient if engineers and architects took the time to manually set hyperlinks and scale during the authoring process. This isn't done because the engineers and architects do not get reimbursed for this additional work and was not a requirement in the paper process.

PROJECT #: 01.024
TITLE: Document Tools for Producing and Publishing Engineering Documents – Page 2

APPROACH:
1. Initial one-day group meeting.
2. Develop MicroStation Document tools.
   a. Index sheet tool
   b. Section and detail tools
c. Drawing title block tool
   d. Post processing program.
   e. Documentation
3. Develop AutoCAD Document tools.
   a. Index sheet tool
   b. Section and detail tools
   c. Drawing title block tool
   d. Post processing program.
   e. Documentation

COST:
Item 1: $12,000
Item 2: $40,000
Item 3: $40,000
Total: $92,000

PRODUCT:
The final products will be four programs with appropriate documentation. Two programs will be used with Microstation and two with AutoCAD.

CUSTOMERS:
All federal and non-federal agencies involved in the production and receipt of engineering drawings.

REMARKS:
This is a continuation of project #99.012

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 75 installations
Corps - 41 district offices
Navy - 42 installations
Air Force - 60 installations
Other Agencies - installations

PROJECT #: 01.024
TITLE: Document Tools for Producing and Publishing Engineering Documents – Page 3

What is the measurable time or cost savings with the implementation/use of this product?
The software produced by this project could save an average of 8 hours per electronic bid set. Assume 30 bid sets per district or installation and GS 7 step 5 engineer at $51 per hour. Potential annual savings are $2,700,000. B\C ratio = 30

What, if any, non-quantifiable benefits will be realized?
Promotion of the Uniform Drafting System. Increased quality control. Use by the private sector.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
Yes

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.025

TITLE: Virtual Facility Management and Project Delivery Support (Phase 1, Stage 2)

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
We need to blend our information technology (IT) resources to let us more effectively focus on our customers' needs and more efficiently deliver their real property improvement objects. The fundamental IT resource components being separately focused and applied are our Geospatial Information Systems (GIS), Computer Automated Design and Drafting Systems (CADD), Program and Project Business Automated Information Systems (AIS-Oracle dB Warehousing), and Digital Audio/Visual (DAV) Systems. Our requirement is to focus these fundamental information resources via a Web enabled Business Enterprise Management system. The resolution is to provide one direct and high performance user access portal to the "Virtual" Facility Management and Project Delivery objects being rendered to support the customers' real property improvement needs. The objective is to provide dynamically shared and scaleable business information that business leaders, stakeholders, operations managers, production managers, resource managers, and the production/service team members must tie to the ground to meet our Nation's needs.

JUSTIFICATION:
Presently our GIS, CADD, AIS, and DAV data sets, operating processes, data storage and delivery platforms are unlinked and used as separate independent systems. This current condition causes tremendous redundancies and effort in the collection, storage, assembly, and delivery of needed information. The effect is hard to synchronize multiple perspectives and often-different versions of facility and project objects and respective information. The results are continuously and adversely impacting our collective abilities to be more responsive to our customers' needs (including cost and time). Implementing the blended solution provides the means to eliminate inefficient redundancies thereby increasing the accuracy and responsiveness of our production

and service teams, sharing and providing the mutually well-defined objects to our customers where and when they need them.

APPROACH:
Incrementally blend and implement the required solution(s) through leveraging and partnering. Phase 1 blending solution limited to facility and project business information with high definition 2-dimensional objects. Leverage by adopting, adapting, and/or integrating known solutions that are in-service, being implemented, under design, or in development, and applying commercially available hardware and software. Partnering and teaming with the owner(s) of the solution(s) for the required Site (CENAB) to quickly document positive feasibility and implement solution.

COST:
This proposed FY 2001 Phase 1 Stage 2 effort has an approximate cost of $155,000 that is based on an estimated level of effort equivalent to 5 people for 6 months (2.5 FTE @ $62k/FTE). Estimate also assumes 15-30 percent of partnering effort to be by the Patuxent MD NAVAIR experts and the balance being Army Corps Balto labor and contractor support.

PRODUCT:
This proposed FY 2001 Phase 1 Stage 2 product is to provide the implementation component needed to efficiently tie GIS and CADD objects to the Oracle dB warehouse. This proposed scope includes feasibility (positive) documentation, Design and/or As Built documentation, O&M documentation, and transfer of knowledge. In FY 2000 our District is scheduled to complete the: (a)The Phase 1 Stage 1 working prototype service providing a Web-enabled customer and production team-oriented Project Status report that includes simple vicinity maps and location of improvement features maps with work-in-progress photos; and (b) Inventory and catalog of all existing and work-in-progress GD&S data holdings as prescribed in our GD&S Implementation Plan.

CUSTOMERS:
Directly used by any/all Army Corps Baltimore customers, partners, facility managers, decision-makers, and project delivery team members. This includes Federal (Domestic and DOD), State, Local governments, other public organizations (including Utility companies), contractors and vendors.

REMARKS:
This proposed phase is to quickly test feasibility of adopting or adapting the Oracle, CADD, GIS solution employed by the Patuxent MD Navy installation and, if positive, establish a partnering procedure and schedule to blend and integrate thier GIS/CADD/ORACLE with the standard USACE Program and Project Business (Oracle dB)System, our standard USACE Web-enabling Software(Oracle) and computer automated IT platform (SUN, NT). This should also provide the proof of solution for all Army Corps Regions and Districts and a major portion of the proof of solution for all USACE Army (Installations) Customers.

PROJECT #: 01.025
TITLE: Virtual Facility Management and Project Delivery Support (Phase 1, Stage 2) – Page 3

Future phases look to leverage other initiatives known by the IT Center like the FY 2001 proposal to Leverage State and Municipal Gov't GD&S resources.

The end state objective is to have easy, dynamic, fully-shared, 3-dimensional Virtual Facilities and Projects on-line for quick resource improvement decisions and project delivery using U.S. Army Corps of Engineers authenticated information and commercially available computer support tools.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Installations support by USACE (See Customers installations
Corps - HQ, All MSC and Districts (See Customers and Remar district offices
Navy - USACE Navy Customers (See Customers and Remarks) installations
Air Force - installations
Other Agencies - All USACE customers (See Customers and Remarks) installations

What is the measurable time or cost savings with the implementation/use of this product?
There are multiple operations' procedures that will experience reduced effort and others will no longer require any direct human labor. Two almost minor but easily documentable examples that eliminate human labor are as follows:

Conservative annual savings in the amount of $374,400 for Military, Public Works, and Environmental standard information collection, assembly, and delivery requirements for monthly Project Review Board Meetings: 20 people x 8 hrs x $65.00/hr X 12 mo) = $124,800.00 x 3 = $374,000.

Above considered minor because of the: (1) Many continuous requests for this same project data in slightly different query/output image formats; (2) Major quantifiable potential savings related to accelerated real property improvement design and review schedules based on quickly reusing and sharing "off-the-shelf" project delivery plans, schedules, cost estimates, and product/service documents.

There are 3 similar business program/project information requirements including standard OMB/Congressional needs that conservatively triple the above to annual savings of $1,123,200 that needs to/would be applied to increasing accuracy and integrity of the information.

B/C ratio = 7.2/1

What, if any, non-quantifiable benefits will be realized?
Greater direct customer and taxpayer satisfaction and trust that comes with increased information availability, accuracy, integrity and responsiveness.

PROJECT #: 01.025
TITLE: Virtual Facility Management and Project Delivery Support (Phase 1, Stage 2) – Page 4

Are commercial-off-the-shelf alternative products available?
Yes

If yes, what products?
Blending Oracle, ArcView/Info, AutoCAD

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?
No end user training. 2-3 Bus Ent Sys Admins

Are hardware or software upgrades required?
Yes

If yes, at what cost per workstation and/or user?
Free PC plug-in(s)

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
At least partial solution at Patuxent MD NavAir ?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.026

TITLE: Evaluate Quantity Takeoff for CADD-COST Software Integration

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Integrate Cost Engineering and Computer Aided Design and Drafting (CADD) to enable cost engineers to work in the CADD environment to perform material / quantity take-off and populate databases portable to estimating software.

The object of this proposal is to implement initial investigative stages to achieve the above requirement. Implement this requirement through development of cost estimating tools and interface for the cost engineer to work in the CADD environment. Using functioning tools and effective interfaces, educate cost engineers to work with and in the CADD environment to perform material / quantity take-off and populate databases portable to estimating software. The future is to integrate the Micro-Computer Aided Cost Estimating System (MCACES) into the Corps vision for Totally Integrated Project Delivery (TIPD).

The product proposed is a report presenting; 1) the CFAC team evaluation of the DeskTop Digitizer & Auto Takeoff programs and 2) a listing of commercial Cost-CADD software to include CFAC team evaluations with conclusions and/or a recommended path forward.

JUSTIFICATION:
This report will identify CADD-Cost software options that are commercially available. Such a listing and evaluation can reduce the decision efforts when selecting a CADD-Cost software. This report may also help to focus the Government and commercial developers on software applications that benefit and enhance cost engineering needs. Developing innovative simple electronic support tools for cost engineers to use in the estimating process should provide

incentive for the cost engineer to work within the CADD environment. This will eventually lead to incorporating the Cost Engineer into TIPD.

APPROACH:

a. Gather, review, existing MicroStation Development Language files (MDL, etc.) developed by Mr. Sillers and Mr. David Brown, Savannah District.

1. Update existing DeskTop programming to function in current MicroStation versions.
2. Determine limitations and capabilities of the existing DeskTop Digitizer & Auto Takeoff program.
3. Prepare a narrative documenting current development and capabilities.

b. Research, gather and evaluate technical literature / information of commercially available software that may perform similar CADD-Cost design integration.

1. Conduct a team evaluation of commercial software literature or demo software.
2. Prepare a narrative documenting the team evaluations.
3. Contact vendors to determine interest in partnering or future cooperation for development of integrated CADD-Cost software.

c. Prepare report for distribution, August 2001.

COST:

ITEM	NUMBER	QTY	RATE	AMOUNT
a. Gather / Review Files	2 Team Mbrs	20 Mhr	$75 /Mhr	$ 3,000
1. Update and test DeskTop files	2 Team Mbrs	24 Mhr	$75 /Mhr	$ 3,600
2. Determine capabilities of DeskTop Digitizer & Auto Takeoff	2 Team Mbrs	32 Mhr	$75 /Mhr	$ 4,800
3. Prepare narrative	3 Team Mbrs	16 Mhr	$75 /Mhr	$ 3,600
			Subtotal	$15,000
b. Research / Gather Technical Information	2 Team Mbrs	16 Mhr	$75 /Mhr	$ 2,400
1. Team evaluation of commercial software.	3 Team Mbrs	32 Mhr	$75 /Mhr	$ 7,200
2. Field evaluation of software currently in-use (assume two locations, two 3 day trips)	2 Team Mbrs	48	$75 /Mhr	$ 7,200
Travel & Per Diem	2 Team Mbrs	2 Trips	$900	$ 3,600
3. Prepare narrative	3 Team Mbrs	16 Mhr	$75 /Mhr	$ 3,600
4. Contact 2-3 vendors following evaluations	1 Team Mbrs	16 Mhr	$75 /Mhr	$ 1,200
			Subtotal	$25,200

PROJECT #: 01.026
TITLE: Evaluate Quantity Takeoff for CADD-COST Software Integration – Page 3

c. Prepare Report (including reviews)	3 Team Mbrs	16 Mhr	$75 /Mhr	$ 3,600
Address Comments	3 Team Mbrs	4 Mhr	$75 /Mhr	900
			Subtotal	$ 4,500
			Subtotal	$44,700
CADD – GIS Center Coordination (WES)			20%	$ 8,940
			TOTAL	**$53,640**

PRODUCT:
The product proposed is a report presenting; 1) the CFAC team evaluation of the DeskTop Digitizer & Auto Takeoff program and 2) a listing of commercial CADD-Cost software including CFAC team evaluations with conclusions and a recommended path forward.

CUSTOMERS:
Customers would include the U.S. Army Corps of Engineers Districts, the Tri-Services, Industry and Commercial, Cost Engineers, and Design Engineers.

REMARKS:
This project is anticipated to carry over into future Fiscal years with the direction and emphasis defined by future project proposals. Initial efforts need to focus on the development of the programming / software for quantity takeoff from CADD drawings; be that purchased commercial software or developed specifically for TIPD.

Following successful programming, the format for distribution (CD-ROM distribution, Internet, etc.) would be developed. Learning from past experience, expertise to support the development of the install programming is necessary. This is a very critical item for successful distribution and subsequent program implementation. The Internet capability is also a source for distribution and will require the assistance of programming experts and issues about where the data/programming will be located on the Internet. A web application similar to ProjectWise may also be considered.

Delivery Dates:
Report submittal, August 2001

FY00 Completed Items:
This was not an active project in FY00.

PROJECT #: 01.026
TITLE: Evaluate Quantity Takeoff for CADD-COST Software Integration – Page 4

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Corps - 40 District Offices, and
Installations throughout the Tri-Service organization; Army, Navy, Air Force.

What is the measurable time or cost savings with the implementation /use of this product?
Assume ½ of all Corps Districts may actively seek and research to purchase a CADD-to-Cost take-off software.

Assume the remaining Districts will benefit from the other half's efforts.
40 Districts x 0.5 = 20 ea.

Assume 40 Man-hours to research at $75/Man-hour (approx. GS-12 including overheads)
Assume 80 Man-hours effort for management and District buy-in at $75/Man-hour
(40 + 80)Mhr x $75.00 = $9,000 cost at each District

Assume the cost of quality CADD-to-Cost software is $2,000

Assume 5 Districts (about 10% of the Districts) are not satisfied with their first purchase and purchase a second software package that will meet their needs.

5 Districts x 20 Mhr x $75.00 =	$7,500
5 Districts x $2,000 each =	$10,000
	$17,500

COST SUMMARY

20 Districts x 120 Mhr x $75.00 =	$180,000
5 Districts purchasing second software	17,500
	$197,500

Potential cost savings: $197,500 - $39,600 = $157,900

B/C ratio = 5/1

What, if any, non-quantifiable benefits will be realized?
Cost Engineers will learn and become aware that CADD-to-Cost can be a tool to assist with development of cost estimates.

Are commercial-off-the-shelf alternative products available?
No, This product (report) is intended to catalog CADD-Cost programs.

The following illustrate some history of efforts to develop CADD-Cost integration. The following is not a complete list. It is based on conversation and related personal experience.

PROJECT #: 01.026
TITLE: Evaluate Quantity Takeoff for CADD-COST Software Integration – Page 5

Powerscope:

History: Bentley developed this product. It allows a review capability through redlining techniques. This software may allow for access to existing design data in a MicroStation (DGN) AutoCAD (DWG) and a DXF format.

Comment: Attempts to run / implement a beta version ('97 – '98?) were unsuccessful. Inquires and discussion groups agree that this software appears **not** to have the capability to do material takeoffs and store the information electronically.

Continued / Future Development: Unknown.

Modular Design System (MDS):

History: Louisville District, CERL, WES, Bentley, and BSD developed this software. It was developed primarily as a CADD/COST/SPECS interface. Fort Worth District, Fort Hood VMS both have utilized this software.

Comment: "We (Fort Worth) found (and this applied to the estimate also) the software to not be sufficiently developed for the design life of a project to be attractive enough for us to set aside present tools."

Continued / Future Development: Unknown.

Products used or in-use:
On-Center Software – reads *.cal and AutoCAD files
Source View / SvReader – reads *.cal files, limited ability for quantity take-off and limited ability to export generated information.

Other products:
Pro/Engineer - designed by Parametric Technology Inc.
ProjectBank - designed by Bentley
ProjectWise - designed by Bentley
Tri-forma - Bentley (Note: At the last SAC/FAC meeting it was discussed that Bentley has asked to teach Triforma)

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes, the completion point for this report is August 2001. Future stages of development and completion points will be defined by future Fiscal year project proposals.

PROJECT #: 01.026
TITLE: Evaluate Quantity Takeoff for CADD-COST Software Integration – Page 6

Is training required for the product?
No

Are hardware or software upgrades required?
No

Could this product be overtaken by commercial/industry developments within the next two years?
No, this product (report) is intended to be a compilation of current CADD-Cost software.

Is there anything similar currently in use?
No, A catalog listing of integrated CADD-Cost software doesn't appear to be available at this time.

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.027

TITLE: e-Business for AEC+FM

ORIGINATOR AND SERVICE PROPONENTS:
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Marine Proponent - Paul Bouley, (703)695-9758, bouleypj@hqmc.usmc.mil
Center POC - David Horner, (601)634-3106, hornerd3@wes.army.mil

REQUIREMENT AND OBJECTIVES:
E-Business has become a catalyst for tremendous excitement and activity in industry. Web-enabled software and business processes have become common. In the last year the advent of XML technology spawned standard making activities in most industries, including the AEC+FM industry. The International Alliance for Interoperability (IAI) has made great progress towards creating an International standard (International Foundation classes – IFC) for a common AEC+FM model, shared among software used by the most prominent participants in projects. Recently the most prominent XML standardization effort for the AEC+FM industry, aecXML (www.aecxml.org), joined the IAI. XML serves as a transport mechanism between IFC-compatible sources, and will serve as a basis for a proliferation of e-business applications. Version 1 of aecXML will be published in late 2000.

While industry will rapidly proceed with standardization of aecXML schemas, the Center has to represent Federal Agencies in their special needs. Regulations, security concerns and other issues make their needs different from broad industry in some respects. The objective of this project is to review the special needs of the government, not commonly met by industry, and to ensure that aecXML schemas are developed to meet these needs.

JUSTIFICATION:
Progress in the e-business world takes place at “internet-speed”. The aecXML standardization effort is expected to develop very rapidly and applications bases on it will become available very soon. In order for federal agencies to fully benefit in the cost saving afforded by this technology the special needs of these agencies have to be determined and accounted for in aecXML schema standards.

PROJECT #: 01.027
TITLE: e-Business for AEC+FM – Page 2

APPROACH:
This project will be led by Francois Grobler of USACERL with David Horner of the Center particpating in all phases for FM perspective.

Task 1: Coordinate with and review evolving aecXML standards.

Task 2: Survey the needs for e-business applications in AEC+FM for selected federal agencies. Identify the special information management needs and prepare report

Task 3: Convene a conference of federal agencies to review and confirm the special information needs. Involve potential software vendors and promote the production of software.

Task 4: Analyze needs and prepare proposed aecXML schemas for priority requirements.

Task 5: Guide the proposed aecXML schemas through the standard making process.

Task 6: Convene conference of software vendors to stimulate adoption of the Federal aecXML standard in their software.

COST:
FY01: $155,000

Cost includes collaboration between the Center and other federal agencies, industry, and academia.

PRODUCT:
1) Report on e-business requirements in AEC+FM for federal agencies, including their special needs
2) Conference/workshop on e-business in AEC+FM for federal agencies – clarification/confirmation of requirements.
3) aecXML schema standard to serve needs
4) Conference to promote this standard among software vendors

CUSTOMERS:
All agencies performing design, construction and FM.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices

PROJECT #: 01.027
TITLE: e-Business for AEC+FM – Page 3

Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

What is the measurable time or cost savings with the implementation/use of this product?
The products will be a framework for other web-based object products. Cost savings will be realized through effeciency in other Center projects and supporting software. Estimated savings to be $750,000 through establishing a baseline for objects and more efficent project tools. Formalizing XML is essential to interoperability for next generation information discemination tools. B/C ratio = 4.839/1

What, if any, non-quantifiable benefits will be realized?
Standard objects will improve data quality of all supporting products.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.028

TITLE: AEC+FM Object-Oriented Standards Demonstration Project

ORIGINATOR AND SERVICE PROPONENTS:
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Warren Bennett, (601)634-3995, bennetw@wes.army.mil

REQUIREMENT AND OBJECTIVES:
The International Alliance for Interoperability (IAI) has made great progress towards creating an International standard (International Foundation classes – IFC) for a common AEC+FM model, shared among software used by the most prominent participants in projects. IFC Release 2.0 was published in March 1999 and commercial software based on that release is being demonstrated now. This IFC-compatible software will become commercially available starting late 2000.

The significance of full integration can not be underestimated in the way design, construction and facility management will conduct in the future. The objective of this project is to demonstrate the new software in the context of a real agency project and explicitly examine the effects on current practices. Recommendations of new and improved practices will be based on the lessons learned in the demonstration project.

JUSTIFICATION:
The significance of full integration can not be underestimated in the way design, construction and facility management will be conducted in the future. Government agencies must prepare for the imminent capabilities of fully integrated project models that are shared among project participants along the life-cycle of the facility.

APPROACH:
This project will be a joint project lead by David Horner of the Center and Francois Grobler of USACERL.

Task 1: Survey the available commercial IFC-compatible software for AEC+FM and characterize their capabilities in a report for use by agencies.

PROJECT #: 01.028
TITLE: AEC+FM Object-Oriented Standards Demonstration Project – Page 2

Task 2: Select a nominated project from a participating agency and plan demo project details.

Task 3: Make arrangements with software vendors to support the demonstration project and educate/train project participants in IFC and IFC-compatible software

Task 4: Assist the demonstration project participants in using the integrated, shared project model and associated software to perform their normal project contributions during design and construction phase, as well as FM.

Task 5: Study the efficacy of the new software to perform normal functions and document new capabilities. Report on how these new capabilities performed, characterize cost savings and quality/time benefits and recommend how the can be used to improve project delivery.

COST:
FY01: $105,000

Cost includes collaboration between the Center and other federal agencies, industry, and academia.

PRODUCT:
1) Report for use by agencies to characterize the capabilities of available commercial IFC-compatible software.
2) Report to document fundamental requirements and common practices of agency project control, including legacy software.
3) A conference of vendors and selected agency personnel
4) Report with recommendations for modifications in vendor software, based on agency requirements
5) Report recommending improved project control using new technologies
6) Demonstration project and final report.

CUSTOMERS:
All agencies performing design, construction and FM.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices
Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

PROJECT #: 01.028
TITLE: AEC+FM Object-Oriented Standards Demonstration Project – Page 3

What is the measurable time or cost savings with the implementation/use of this product?
The product will be a framework for validating other object products. Cost savings will be realized through efficiency in other Center projects and validating software for compliance. Estimated savings to be $250,000 through establishing a baseline for objects and V&V methodology. B/C ratio = 24/1

What, if any, non-quantifiable benefits will be realized?
V&V as an integral part of standardization those leads to customer confidence and a stronger standard.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.030

TITLE: Costs, Accounts and Financial Elements in FM

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
The International Alliance for Interoperability (IAI) has made great progress towards creating an International standard (International Foundation classes – IFC) for a common AEC+FM model, shared among software used by the most prominent participants in projects. IFC Release 2.0 was published in March 1999 and commercial software based on that release is being demonstrated now. This IFC-compatible software will become commercially available starting late 2000.

Continuation of the work is to address the needs of financial aspects in FM. This work will build on previous IAI work to insure the needs of FM are included in the existing objects and to create objects that are unique to FM finances.

JUSTIFICATION:
Facility acceptance, operations, maintenance, replacement and retirement require specific financial information. This project will insure that the IFC contains objects that enable the FM director to manage the facility components, support preventive maintenance, assist in facilities decisions based on value, and other issues that will be revealed in the early stages of the project. This will enable vendors of COTS software in this area interoperate with other IAI based tools so that the FM director can build a tool set of FM software that meets their needs.

APPROACH:
1) Build the process model that encompasses the life-cycle of the facility and its components.
2) Build the domain informaiton model that identifies entity objects and their facilitating objects.
3) Integrate the model into the IFC and resolve interface problems.
4) Build test cases and walk the cases through the integrated model.
5) Release.

PROJECT #: 01.030
TITLE: Costs, Accounts and Financial Elements in FM – Page 2

COST:
FY01: $125,000
FY02: $85,000

Cost includes collaboration between the Center and other federal agencies, industry, and academia and associated travel. Other agencies, industry, and academia will contribute in kind for their portion in the collaboration.

PRODUCT:
A requirements document outlining the scope of the work.
A process model that describes the actions supported by the objects and that identifies objects that will be used in the process.
A domain informaiton model that displays and describes the interactions of the entity objects and their facilitating objects.
An initial integration of the work into the IFC and a report on the resolutions.
A test plan and associated test cases. Results of the tests will be published upon completion of the tests.
A published update to the IFC that includes the work for FM finances.

CUSTOMERS:
All agencies performing design, construction and FM.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices
Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

What is the measurable time or cost savings with the implementation/use of this product?
The standard objects developed to date have been shown to completly interoperate with no errors and dramaticlly reduce data conversion time between COTS software. Assume 100,000 data conversions are performed per year by people that cost and average of $25 per hour. Assume that each data conversion, including verification, takes 1 hour when not using standard objects. We have seen that data conversions with standard objects take less than 5 minutes and produce no degredation in data content or quality. Therefore, the cost of the new technique would be at most 10% of the status quo cost or 100,000 * 25 * 10% $250,000. The cost savings will be at least $2,250,000. B/C ratio for FY01 = 18/1; B/C ratio for FY02 = 26.47/1

PROJECT #: 01.030
TITLE: Costs, Accounts and Financial Elements in FM – Page 3

What, if any, non-quantifiable benefits will be realized?
This is a new project in the work that produces AEC Object Standards. COTS software vendors of accounting souftware will be able to interoperate with CADD, PM, and FM tools enabling the manager to build an interoperable tool set for their work.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.031

TITLE: Total Base Realignment and Closure Management

ORIGINATOR AND SERVICE PROPONENTS:
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Center POC - David Horner, (601)634-3106, hornerd3@wes.army.mil

REQUIREMENT AND OBJECTIVES:
The International Alliance for Interoperability (IAI) has made great progress towards creating an International standard (International Foundation classes – IFC) for a common AEC+FM model, shared among software used by the most prominent participants in projects. IFC Release 2.0 was published in March 1999 and commercial software based on that release is being demonstrated now. This IFC-compatible software will become commercially available starting late 2000.

Continuation of the work is to address the need to facilitate the interaction of CAD software with management of major/minor military installations to facilitate the BRAC initiative. The required maintenance of closed bases requires special considerations that are not commonly included in commercial software. The Center's alliance with the IAI and the acceptance of software vendors to the IFC enable the Center to extend the IFC for government's needs.

JUSTIFICATION:
Closed facility acceptance, operations, and maintenance requires specific information not commonly associated with FM tools. This project will insure that the IFC contains objects that enable the FM director of closed facilities to manage the facility components, support preventive maintenance, assist in facilities decisions based on value, and other issues that will be revealed in the early stages of the project. This will enable vendors of COTS software in this area interoperate with other IAI based tools so that the FM director can build a tool set of FM software that meets their needs.

APPROACH:
1) Build the process model that encompasses the life-cycle of the facility and its components.
2) Build the domain informaiton model that identifies entity objects and their facilitating objects.
3) Integrate the model into the IFC and resolve interface problems.

4) Build test cases and walk the cases through the integrated model.
5) Release.

COST:
FY01: $125,000
FY02: $85,000

Cost includes collaboration between the Center and other federal agencies, industry, and academia and associated travel. Other agencies, industry, and academia will contribute in kind for their portion in the collaboraion.

PRODUCT:
A requirements document outlining the scope of the work.
A process model that describes the actions supported by the objects and that identifies objects that will be used in the process.
A domain informaiton model that displays and describes the interactions of the entity objects and their facilitating objects.
An initial integration of the work into the IFC and a report on the resolutions.
A test plan and associated test cases. Results of the tests will be published upon completion of the tests.
A published update to the IFC that includes the work for FM finances.

CUSTOMERS:
All agencies managing closed facilities.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices
Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

What is the measurable time or cost savings with the implementation/use of this product?
The standard objects developed to date have been shown to completly interoperate with no errors and dramaticlly reduce data conversion time between COTS software. Assume 100,000 data conversions are performed per year by people that cost and average of $25 per hour. Assume that each data conversion, including verification, takes 1 hour when not using standard objects. We have seen that data conversions with standard objects take less than 5 minutes and produce no degredation in data content or quality. Therefore, the cost of the new technique would be at most

10% of the status quo cost or 100,000 * 25 * 10% $250,000. The cost savings will be at least $2,250,000. B/C ratio for FY01 is 18/1; B/C ratio for FY02 = 26.47/1

What, if any, non-quantifiable benefits will be realized?
This is a new project in the work that produces AEC Object Standards. COTS software vendors of accounting souftware will be able to interoperate with CADD, PM, and FM tools enabling the manager to build an interoperable tool set for their work.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.032

TITLE: AEC Object Standards in XML

ORIGINATOR AND SERVICE PROPONENTS:
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Warren Bennett, (601)634-3995, bennetw@wes.army.mil

REQUIREMENT AND OBJECTIVES:
The International Alliance for Interoperability (IAI) has made great progress towards creating an International standard (International Foundation classes – IFC) for a common AEC+FM model, shared among software used by the most prominent participants in projects. IFC Release 2.0 was published in March 1999 and commercial software based on that release is being demonstrated now. This IFC-compatible software will become commercially available starting late 2000.

The IFC releases are specifically developed for incorporation into COTS software. There exists a need to place this same level of interoperability into the information retrieval market. Web-based AEC information is available to the global market through the Internet. However, there is not a well defined interoperabilty for the Web enabled tools to make AEC+FM information interdependent as the IFC does in software. The XML offers a means for the interoperability if there is a formal definition for the domain. The objective of this project is to participate in standards boards that are addressing this deficiency.

JUSTIFICATION:
The IAI has a schedule for releasing IFC to vendors for development of interoperable software. This enables software from various vendors to communicate at the data level to other software. There is no parallel formalism for the web.

The IAI has initiated the aecXML Domain lead by representatives from McGraw-Hill to formalize an XML implementation for AEC objects. This work will impact the PM and FM domains. The XML work will make interaction between the FM and PM Domains and the XML Domain. Work to review, comment, and participate in definintion of the XML formalism is required to insure consistent representation between the software vendors and the web enabled

information systems. It is anticipated that software vendors will increase their product's reliance on the Internet making interoperablity between software and web based data essential for seamless operation. Interoperability will require consistent definition of objects in the two medium. The Center needs to be a visible player to insure that the needs of the government are included and that software and XML are not used in a way that will prohibit their use in secure environments.

APPROACH:
In FY01, the project will gather information for a report that will support out year work.

COST:
FY01: $55,000

Cost includes collaboration between the Center and other federal agencies, industry, and academia and associated travel. Other agencies, industry, and academia will contribute in kind to cover their representatives.

PRODUCT:
A report of the aecXML methodology and the areas that need Center visibility in the future.

CUSTOMERS:
All agencies performing design, construction and FM.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - All Engr offices installations
Corps - All district offices
Navy - All Engr offices installations
Air Force - All Engr offices installations
Other Agencies - All Engr offices installations

What is the measurable time or cost savings with the implementation/use of this product?
It is estimated that this project will save $250,000 in lost time costs. It is anticipated that this project will gather information in a timely manner to enable follow-on work to be more efficiently scheduled. B/C ratio = 4.55/1

What, if any, non-quantifiable benefits will be realized?
This is a new project in the work that produces AEC Object Standards. It will contribute to the knowledge of XML and its expected use by industry in the AEC, PM, FM, and GIS realms.

PROJECT #: 01.032
TITLE: AEC Object Standards in XML – Page 3

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.033

TITLE: CADD/GIS Equipment for AMC Bases

ORIGINATOR AND SERVICE PROPONENTS:
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Center POC – Bryan Perdue, (601)634-2286, perdueb@wes.army.mil

REQUIREMENT AND OBJECTIVES:
We would like to prototype Scott Air Force Base, home of Head-Quarters Air Mobility Command (HQ AMC), on documenting and importing utilities using a GPS/GIS type application. We are interesting in exporting this to the Auto-Cad GIS Format. We will then export this method to the remaining 11 AMC Bases: Andrews, Charleston, Dover, Fairchild, Grand Forks, MacDill, McGuire, McChord, McClelland, Pope, and Travis. This would be accomplished within Base Level Communications at all 12 Bases. We will need the CADD Program Auto-Cad and the GPS/GIS Equipment for each AMC Base along with training.

JUSTIFICATION:
We really need your help! Now a days most utilities are updated and provided GPS coordinates via some type of electronic format...Auto-Cad, Intergraph. The Base Communications shops are responsible for maintaining and upgrading the communication utilities; however, they are in great need of a more modern system. Currently, the Base Communications Shops must update a hard copy of the blue-print and send it to the 38th at Tinker AFB to be captured electronically, then the 38th sends back an updated hard-copy! We have been trying to get a CADD System for about 5 years now. This matter has become more urgent coupled with the fact that the 38th is being downsized. In addition, HQ AMC/CEV is converting all utilities to an internet web-site in a GPS Format within the .mil community. The Base Communications Shops will be responsible for providing updates to the web-site contractors. The Shops will need access and training to GPS equipment. The Shops will also get poised to electronically update the comm utilities as the 38th draws down.

PROJECT #: 01.033
TITLE: CADD/GIS Equipment for AMC Bases – Page 2

APPROACH:
We would like to establish Scott AFB as a prototype and then export the process to the remaining 11 AMC Bases.

COST:
$7,400 per Base X 12 Bases = $88,800.00

Based on $2,500 Cost for Auto-Cad and $4,900 for the GPS/GIS Equipment & Training

PRODUCT:
The ability to capture GIS/GPS data and import this data into the Auto-Cad program to update the commutility infrastruture.

CUSTOMERS:
Communication Majcom, 38th Air Force at Tinker AFB, Civil Engineering, and any other users interested in our prototype.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - installations
Corps - district offices
Navy - installations
Air Force - 36+ installations
Other Agencies - installations

What is the measurable time or cost savings with the implementation/use of this product?
Valuable time and accuracy will be gained since the drawings will not be updated by a third party. Valuable skills & training will be provided to the military members. It is estimated that this project will save approximately $200,000 in lost time costs. B/C ratio = 2.25/1

What, if any, non-quantifiable benefits will be realized?

Are commercial-off-the-shelf alternative products available?
Yes

If yes, what products?
Auto-Cad, Intergraph, Arc View, ...

Does the project conform to current technology?
Yes

PROJECT #: 01.033
TITLE: CADD/GIS Equipment for AMC Bases – Page 3

Does the project identify well-defined stages of development with clear completion points?

Is training required for the product?
Yes

If yes, how many people per agency?
2 per Base

Are hardware or software upgrades required?
Yes

If yes, at what cost per workstation and/or user?
$2,500

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
Intergraph

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.034

TITLE: Web Based Facilities Information System

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Implement at Anniston Army Depot (ANAD) a web based Facilities Information System (FIS) to allow access to spatial (GIS) and facilities data through a web based interface. The FIS will be intergrated with the existing Environmental Information System (EIS) at ANAD and build on the limited access FIS system currently deployed. Integration of the FIS and EIS with a web based interface will leverage the base mapping and data in the FIS with the regulatory sensitive EIS data and make it widely available on the ANAD intranet.

JUSTIFICATION:
To support the on-going facilities support functions at ANAD, an accessible, user friendly facilities information management system is critical to facilitate communication, interpretation, and decision-making associated with facilities support functions. An integrated FIS loaded with legacy data and data generated from on-going activities within the boundaries of ANAD will provide a consistent, centralized, and timely means of collecting, analyzing, and communicating facilities data to base personnel, project managers, contractors, and regulators. Availability of current facilities data via a web interface will reduce the need to provide hardcopy maps of building layouts, utilities, etc. by allowing users to view online images of specific locations with selected layers in an interactive environment.

APPROACH:
a. Data Collection and System Design - Data collection to include gathering source information to be loaded and compiled on CDs to act as system backup. System design to include analysis of the data types gathered for inclusion in the FIS with the intent to implement within SDSFIE standards to the greatest extent possible and documentation of any data outside the standards.

PROJECT #: 01.034
TITLE: Web Based Facilities Information System – Page 2

b. System Configuration and Customization - System configuration to include identification of hardware and software to support the current and future data storage and access requirements to provide server support and integrated access with the EIS. The system will be customized in accordance with criteria in the System Design Document developed for ANAD's EIS, to include tabular and spatial reporting and any necessary funtionality enhancements.

c. Data Loading - Tasking to include all necessary conversion, loading, and integrity checks of the data to be loaded into the FIS.

d. Data Update Process Design and Test - Tasking to include analysis, design, development and testing of the process necessary to load future data into the FIS. Development to include process definitions and instructions to load additional data into the FIS without programmatic manipulation.

e. Training and Documentation - Tasking to include on-site training and documentation for a minimum of 6 ANAD employees in a train-the-trainer scenario. 10 copies of finalizied user documentation should include any refinements/corrections identified during the on-site training session.

COST:
a. - $10K
b. - $20K
c. - $20K
d. - $10K
e. - $10K

Total - $70K

PRODUCT:
Operational and current FIS with a web based interface and integrated with the EIS that is accessible from the ANAD intranet. Documented procedures for updating spatial and tabular data. Documentation identifying system components and intrerfaces.

CUSTOMERS:
Facilities management and engineering elements, environmental control elements (Depot employees, contractors, and regulators), ANAD maintenance elements, and tenant activities.

REMARKS:
Integration of the FIS with the EIS will place both systems on a common foundation to allow a coordinated approach to all GIS management issues. This system could serve as a pilot for future implementations at other locations, but for this project only ANAD costs and savings are considered.

PROJECT #: 01.034
TITLE: Web Based Facilities Information System – Page 3

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 1 installations
Corps - district offices
Navy - installations
Air Force - installations
Other Agencies - installations

What is the measurable time or cost savings with the implementation/use of this product?
Currently two engineering draftsmen spend approximately half their time printing original maps or making multiple hardcopies of existing maps, assume this could be reduce by 75%. Additionally, 35 design, environmental, and manufacturing engineers could eleminate approximately one hour per week searching for current and historical facilities data that would be easily available.

2 GS-7, step 5, draftsmen X 50% workload ($32,032/yr X 2 X .50 = $32,032/yr X 75% reduction)
$24,024/yr savings

35 GS-12, step 5, engineers X 1 hr/wk X 52 wk/yr (35 X $27.23/hr X 1 hr/wk X 52 wk/yr)
$49,559/yr savings

Total estimated savings - $24,024 + $49,559 = $73,583/yr

B/C ratio = 1.05/1

What, if any, non-quantifiable benefits will be realized?
User access to current maps should reduce time to prepare for maintenance and repair projects by making reliable data available on-line. Decision makers will be able to have direct interaction with critical data as needed, where needed.

Are commercial-off-the-shelf alternative products available?
Yes

If yes, what products?
Intergraph's Geomedia Pro and Geomedia Web Map

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

PROJECT #: 01.034
TITLE: Web Based Facilities Information System – Page 4

Is training required for the product?
Yes

If yes, how many people per agency?
6

Are hardware or software upgrades required?
Yes (to the COTS software)

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
Geomedia Pro, Geomedia Web Map

INITIATIVE: STRATEGIC RESULTS

GOAL: IMPROVE BUSINESS PRACTICES THROUGH THE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.035

TITLE: CADD-based Circuiting Tool

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
This project will provide a CADD-based “Circuiting Tool” that allows the designer to manipulate electrical system information in preparation for the design analysis. Currently, the designer lays out an electrical system, i.e. the receptacle or lighting fixture plan, in CADD. After the arrangement is deemed satisfactory, the designer will circuit the components (receptacles, lighting fixtures, etc.) and determine the “load value” they represent. This load will be accumulated in a panel schedule and a design analysis.

The product of this project will be a tool that operates in the CADD environment and “recognizes” CADD elements by associating them with descriptions in a user-modifiable spreadsheet or database file, returns associated values from that file, and performs mathematical computations upon those values. Note that this approach could be extended to mechanical systems (diffusers/ducts/air handlers, fixtures/pipes/mains) as well. (SEE PARAGRAPH "PRODUCT" BELOW FOR MORE INDEPTH DESCRIPTION OF HOW IT IS EXPECTED TO WORK)

JUSTIFICATION:
This project will allow the CADD designer to "pass" on information into a design analysis software package. This project will allow the designer to perform some of the design analysis while performing the circuiting portions of the design.

PROJECT #: 01.035
TITLE: CADD-based Circuiting Tool – Page 2

APPROACH:
I strongly recommend that a contract with a District that has a proponent that performs "vertical building" type design and has the knowledge to write this interface be utilized.

COST:
It is estimated that about 25K to 30K to produce.

PRODUCT:
The primary function of the Circuiting Tool is to help the designer circuit devices and determine how their loads should be grouped. The designer (electrical engineer) will place conventional graphical symbols (entities) in a system (power or lighting plan) design file. After the layout is complete, the designer will use the proposed "Circuiting Tool" while in CADD.

All databases/spreadsheets shall be user friendly with intuitive names, common data types, and the ability to export information into similar programs. As a by-product of these databases/spreadsheets, the designer shall be able to sort the information and produce a "bill of materials" of all of the graphic symbols placed. This information can assist in preparing "cost estimates" for projects. Also, if the graphic symbols are created correctly, then distance information can be gathered to feed into the voltage drop and short circuit computations. Finally, if a CADD entity is deleted, its load should automatically be removed from the circuit total.

Adding devices to a circuit

To add devices to a circuit, the designer selects the "Add Device" tool from the menu or palette. A dialog box appears with a drop down list of electrical panels in the database. The first panel is selected by default. A second drop down list contains all the circuits in the selected panel with the first one selected by default. A text box displays the total load of the selected circuit. The dialog box is non-modal and is always in front. The message "Select device to add to circuit" is displayed.

The designer selects the desired circuit (if necessary, the designer can add a new panel and/or circuit using the "Add Panel" or "Add Circuit" command buttons). The designer uses the pointing device to "point and click" on each graphical entity that should be placed on the selected circuit. The Circuiting Tool marks the device as being on the circuit, "looks up" the corresponding device load in the database, then displays the device name and load in a text box.

The "point and click" behavior would be similar to that of the "Accept/Reject" feature in MicroStation in which the "acceptance" for the first graphical entity could be the "selection" for the subsequent graphical entity and so forth.) Each "selection" displays the device name and load. Each "acceptance" updates the total (cumulative) circuit load. For example, if five receptacles each have load value of 180 VA, then the "Total Load" text box will display values of 180 VA, 360 VA, 540 VA, 760 VA, and 900 VA after each "acceptance". Similarly, if each graphical entity has its unique value, say 180 VA, 1000 VA, 360 VA, 180 VA, and 900 VA; then

the values of 180 VA, 1180 VA, 1540 VA, 1720 VA, and 2620 VA would be displayed after each “acceptance.”

The “signal” to close the summation of loads is accomplished by selecting the same element twice in a row or selecting a new panel or circuit. In any of these cases, the last device selected is added to the circuit.

Exceptions:
If the selected entity is not found in the database the operation stops and the device is not added to the circuit. The “Unknown device” message is displayed and a “New Device” command button becomes active. Selecting the button allows the user to enter the device name and load in VA.

If the selected entity has already been added to a circuit, the following message is displayed “Device is on circuit X of panel Y” where X and Y are the circuit and panel names.

If the reject button is pressed, the device is not added to the circuit and the designer continues selecting devices as if the command had just started except that the currently selected panel and circuit are used rather than the defaults.
Removing Devices from a Circuit
To remove devices from a circuit, the designer selects the “Remove Device” tool from the menu or palette. A dialog box is displayed with text boxes for “Panel”, “Circuit”, “Total Load”, “Device” and “Load.” All text boxes are empty by default. The message “Select device to remove from circuit” is displayed.

As with adding a device, the designer uses the pointing device to remove devices using the “accept/reject” behavior. When the first device is selected, its name, load and associated panel/circuit/circuit load information is displayed in the appropriate text boxes. The message “Accept/Reject” is displayed. Selecting another device removes the previously selected device from the circuit. Note that the subsequent device need not be on the same circuit or panel that the previous device was on to signal acceptance.

Exceptions:
If the selected entity is not found in the database the “Unknown device” message is displayed.

If the selected device is not associated with a circuit, all text boxes are empty and the message “Device not circuited” is displayed.

If the reject button is pressed, the device is not removed from the circuit and the designer continues selecting devices as if the command had just started.
Editing Devices

PROJECT #: 01.035
TITLE: CADD-based Circuiting Tool – Page 4

To edit the devices that the Circuiting Tool is aware of, the designer selects the "Edit Device" tool from the menu or palette. A dialog box appears with a drop down list of devices in the database. Device names may be edited. The first device is selected by default. A text box displays the load of the selected device. Another text box displays the graphical symbol name of the selected device. The dialog box is modal, i.e., the user must finish editing devices before adding or removing devices from circuits.

Changes to device information do not affect previous projects. The designer does have the option of propagating these changes through the current project.

Changes to device information affect future projects, i.e., if the designer adds a new device and changes the name and load of another device, all subsequent projects will incorporate these changes.

CUSTOMERS:
The direct user of this product would be the electrical engineer performing the power and lighting design features of any "vertical building" type design. The project is written so that if another design discipline (such as mechanical) can utilize this type of interface then they could benefit from the technology it will create. Also, indirect users could be the Cost Engineering proponents should the "quantity-take-off" features be developed.

REMARKS:
A proponent from CERL has been working on a design analysis package that was created by Ft. Worth District. That proponent may be in a position to utilize this project's product to communicate with the design analysis package. It would be advantageous to have this party available to coordinate the expected results of this project with that of theirs.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - installations
Corps - district offices
Navy - installations
Air Force - installations
Other Agencies - installations

What is the measurable time or cost savings with the implementation/use of this product?
No information provided.

What, if any, non-quantifiable benefits will be realized?

Are commercial-off-the-shelf alternative products available?
No information provided.

PROJECT #: 01.035
TITLE: CADD-based Circuiting Tool – Page 5

If yes, what products?

Does the project conform to current technology?
No information provided.

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
Yes

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No information provided.

Is there anything similar currently in use?
No information provided.

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.036

TITLE: Installation Geospatial Data and Systems Survey

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Survey [Army] installations to determine the extent and nature of CADD and GIS use on the installation, to include the number and degree of integration of systems, extent of business processes supported, awareness and use of Center products and tools, and number, nature of direct employees (government or contract/occupational identification/level of skill) and compliance with existing directives.

JUSTIFICATION:
Increased use and implementation of CADD/GIS technology within the Army is hindered by the absence of reliable data concerning the present state of use within the Army. Decisions are presently based on fragmentary and anecdotal data, which may result in ineffective use of limited Center and military service resources.

APPROACH:
The survey will be based upon a standard set of questions, developed by the service representative(s). The service will identify the installations (and the POC(s), or appropriate offices at each installation) to be contacted, along with any data available as a starting point. Most installations will require contact with both the Facility Engineer and Environmental offices. A service representative will contact the installations using e-mail and phone follow-up as necessary. In many cases this may entail multiple contacts where one set of GIS users is not in effective contact with others at the same site. A surveyor will also contact other service and DOD activities centrally funding installation GIS, including this installation data as well. Survey items will include nature and size of GIS organization, CADD/GIS hardware and software, themes covered, external data sources (including photo imagery), supported applications, end user population, metadata development and availability, and CADD/GIS Center products used.

PROJECT #: 01.036
TITLE: Installation Geospatial Data and Systems Survey – Page 2

It will identify data standards used for each system, along with other Center tools in use. The service representative will guide the survey and assure access to respondents. The findings of the survey will be combined with the existing data collected by The CADD/GIS Technology Center.

COST:
Estimate this survey can be competed for $10,000 for the Army alone, based on two man-months of effort. If desired, other services could be added, with all of DOD completed for $25,000.

PRODUCT:
The product will be a descriptive report, which will include summary of appropriate data and POC contact information in electronic spread sheet format. The report will be primarily distributed as an electronic document.

CUSTOMERS:
Demographic data obtained from the survey will primarily assist the surveyed service(s) develop an improved approach to increase use of CADD/GIS use within their service by highlighting areas where improvements need to be made. It will also assist the Center corporate staff evaluate proposed products and form a more realistic (and credible) base for computing ROI.

REMARKS:
Depending upon survey findings, this project could have significant ramification for future management of GIS.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 65 installations
Corps - 41 district offices
Navy - 110 installations
Air Force -110 installations

What is the measurable time or cost savings with the implementation/use of this product?
Data derived from this project will allow computation of more accurate ROI on future projects. If desired, this use data could be compared with assumed usage for previous projects, to assess potential for improved project selection with better customer data.

What, if any, non-quantifiable benefits will be realized?
The major benefit is that it will assist the surveyed service better direct limited management resources towards those areas with the greatest potential for return.

Are commercial-off-the-shelf alternative products available?
No

PROJECT #: 01.036
TITLE: Installation Geospatial Data and Systems Survey – Page 3

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.037

TITLE: Update of Dredging Related Terms, Standards and Concepts for the Spatial Data Standards for Facilities, Infratructure, and Environment

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
To update and greatly expand the current Spatial Data Standards for facilities, infratructure, and environment (SDSFIE) related to dredging and disposal of dredged material to be consistent with current navigation project requirements, dredged material management plans, and on-going research into developing Corps-wide software for dredged material management. Present SDSFIE related to dredging are based solely on riverine dredging as practiced on the Mississippi River. Coastal and estuarine dredging and open ocean disposal practices and concepts are not included. There is no way to relate dredging and the associated disposal sites. Over 80% of Corps dredging is done via contract. Very little contract information is contained in the present standard.

JUSTIFICATION:
The Corps presently spends about $700M annually on dredging, disposal and related functions (e.g., engineering, contract monitoring, etc.). Virtually every District that conducts dredging has or is developing some kind of a GIS or database structure to assist in managing dredging projects. These databases and GIS have no consistency, in many cases efforts are being duplicated. Under the DOER program (CHL) and the Geospatial Data Management Research Program (CERL), work units are on-going to develop software or databases that can be applied to assist in management and analysis of dredging projects. These research efforts and those of other Districts will benefit greatly by having a comprehensive set of SDSFIE standards. Standards would greatly improve the ability to share information, reduce costs, etc.

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TITLE: Update of Dredging Related Terms, Standards and Concepts for the Corps Spatial Data Standards for Facilities, Infratructure, and Environment – Page 2

APPROACH:
Form peer user group of staff in Corps Districts and HQ. Begin with receiving consensus on basic concepts and definitions developed under DOER research (DMSMART). Review, revise, expand existing standards in SDSFIE in light of consensus on basic concepts. Periodic review and comments by user groups. Work would be joint effort between CHL, CADD/GIS staff with oversight/review by HQ and District reps. CERL related research is trying to integrate financial data (i.e. CEFMS), worthwhile but another major challenge.

COST:
FY01 - $80K
FY02 - $70K

PRODUCT:
Updated SDSFIE, plus a report explaining the concepts and related data dictionary (perhaps included in the standards). Note that a dredging desk reference (i.e, dredging related terms) has also been developed, started in Dredging Research Program, now in HQ, but not completed. We might consider somehow including that or at least provide HQ with justification for finishing it.

CUSTOMERS:
34 Corps Districts perform dredging. Estimate 1,000's of Corps staff involved in some aspect of dredging. This includes staff in operations, engineering, planning and regulatory

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 89 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Other Agencies - 29 installations

What is the measurable time or cost savings with the implementation/use of this product?
Hard to estmate. However, if this effort could reduce overall dredging costs by 0.1%, cost savings would be $700K per year. There is potential for much greater cost savings. The costs of developing a dredging related database for a single Distirct would be quite high, this effort would reduce those costs. B/C ratio = 8.75/1 for Fy01 and 10/1 for FY02

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TITLE: Update of Dredging Related Terms, Standards and Concepts for the Corps Spatial Data Standards for Facilities, Infratructure, and Environment – Page 3

What, if any, non-quantifiable benefits will be realized?
Standards will greatly facilitate sharing of information between Districts and allow Districts to respond to requests for dredging related information. Standards will also make it easier for the Districts to share information with the public via the web.

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
Yes

If yes, what?
Existing SDSFIE Standards

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.038

TITLE: GPS Delineation Survey of Jurisdictional Wetlands, Pope Air Force Base

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Global Positioning System (GPS) Equipment usage for wetlands delineation survey to conform to the latest COE manual, showing entire boundary of the site area evaluated for wetlands. Survey shall show survey points and tabulated data for all wetlands within the area controlled by Pope AFB. The map lines should be continuous, and intersecting the base boundary.

JUSTIFICATION:
The current delineation plans are more than five years old and are deemed obsolete. Each construction project located in the vicinity of the wetlands must have an individual delineation plan for the wetland in the vicinity, incurring additional costs. Due to scarcity of land available at Pope AFB, the base must construct mission essential facilities in the vicinity of the wetlands.

APPROACH:
The GPS unit must produce a 2D RMS Sub-meter accuracy at each survey point using differential GPS techniques. Where vegetation prevents an efficient use of GPS method, establish a separate baseline to the area to be delineated. This baseline will be tied to the NC Lambert grid and each point of intersection (PI) will be clearly marked on the ground. Prepare survey for verification and certification by a representative of the Raleigh or Wilmington NC, Regulatory Branch field office.

COST:
FY01 - $100K
FY02 - $ 50K
TOTAL $150K

PROJECT #: 01.038
TITLE: GPS Delineation Survey of Jurisdictional Wetlands, Pope Air Force Base – Page 2

Above estimated costs are based on the last delineation study accomplished for Pope AFB approximately six years ago. Fort Bragg may be included in the proposed delineation study at an additional cost.

PRODUCT:
Large scale drawings-original and three copies. Ledge size paper survey reports, data tabulation sheets, identification of jurisdictional wetlands by using text symbols or shading, GPS Trimble System, AutoCAD Survey Release 2.0, and AutoCAD Map 2000.

CUSTOMERS:
Design and construction agent (COE, AFCEE), contract A&Es for contract project design, fish and wildlife managers, Conservation managers, and community planners.

REMARKS:
None entered

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army –
Corps –
Navy –
Air Force –
Other Agencies –

What is the measurable time or cost savings with the implementation/use of this product?

What, if any, non-quantifiable benefits will be realized?

Are commercial-off-the-shelf alternative products available?

If yes, what products?

Does the project conform to current technology?

Does the project identify well-defined stages of development with clear completion points?

Is training required for the product?

If yes, how many people per agency?

Are hardware or software upgrades required?

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?

Is there anything similar currently in use?

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.039

TITLE: Development of an SDSFIE Entity Set for Real Property

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
A Space Management study was recently completed by the Center, which evaluated and compared selected existing COTS/GOTS Space Management models and criteria for the purpose of developing a spatial model for Space Management. The recommendation that resulted from that study was basically to add a Space Management Entity Class to the SDSFIE Buildings Entity Set and add attribute tables describing area, contract, facility, facility space, lease, square footage, survey, and miscellaneous. However, upon review, members of the Facility Management Field User Group (FUG) felt that the recommended structure would not support facility managers' work processes because the FM information is in many different tables within many different entity sets and classes. This also impacts project delivery since information that is frequently designed into a facility is extremely useful in maintaining the facility after it is constructed. These standards provide a natural migration path for delivery and use of this information. The FUG agreed that the FMSFIE would support work processes more effectively if it was modeled as a separate, primarily non-graphic, Entity Set with links to the corresponding graphic entity type tables. They concluded that Space Management is an application of real property and, therefore, an Entity Set for real property needs to be created to support facility managers. Therefore, a second phase of the previous study is required to re-examine the information collected in the study and develop a basic schema for a Real Property Entity Set. The resultant entity set should provide a data structure that can be used as an application interface. Real property inventory items from leading CAFM/CMMS applications should be capable of populating the SDSFIE data architecture without modification.

PROJECT #: 01.039
TITLE: Development of an SDSFIE Entity Set for Real Property - Page 2

The objective is to develop the basic schema for a SDSFIE/FMSFIE Real Property Entity Set.

JUSTIFICATION:
This project will benefit all installation facility management activities by providing a standard model that will support facility managers' work processes. Currently, individual organizations are developing in-house data models and applications that support legal reporting requirements for facility management with their own resources. Real Property inventory is the foundation on which all facility management functions are constructed. Currently some of the needed elements are contained within the SDSFIE but not in a manageable configuration. The resulting data set will provide a defacto standard architecture for data transfer between CAFM/CMMS applications or data merging from different products. If implemented with organizational data standards, separate divisions could use products from different vendors and still merge the data together to form a complete organizational real property inventory. The overall goal is to create a data architecture that will move us toward the interoperability goal of Vision 2010.

APPROACH:
* Re-examine and evaluate the information contained in the recently completed Space Management Report. Update and modify information as required.
* Develop a schema and data dictionary for a Real Property Entity Set.

COST:
$60,000

PRODUCT:
A revised Space Management Report, Version 1.0;
Schema and data dictionary for a Real Property Entity Set to be integrated into the SDSFIE/FMSFIE.

CUSTOMERS:
DoD, federal, state, & local government CADD/GIS/CAFM/CMMS users, facility/project managers, and their contractors; and commercial CADD/GIS, CAFM, CMMS software vendors.

REMARKS:
This project will develop a new SDSFIE/FMSFIE Entity Set, which will require periodic updates in order to meet the needs of the users.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this project?
Army - 75 installations
Corps - 41 district offices
Navy - 42 installations
Air Force - 60 installations

PROJECT #: 01.039
TITLE: Development of an SDSFIE Entity Set for Real Property - Page 3

What is the measurable time or cost savings with the implementation/use of this product?
It is estimated that the standard produced by this project can reduce the initial GIS/FM development cost and annual maintenance by $150,000 for each typical individual installation GIS/FM implementation. Each installation may have more than one GIS/FM implementation. If only 1 office at 25% of the 218 installations listed above use this standard, savings is estimated to be ($150,000 * 55) = $8,175,000. B/C ratio = 136.25/1

What, if any, non-quantifiable benefits will be realized?
This project will facilitate the sharing of GIS/FM data and supporting applications within organizations and between agencies. This ability will benefit DoD organizations, other Federal government, state government, local government, international, and private organizations as well as their contractors/consultants.

Are commercial-of-the-shelf alternative products available?
No

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

Are hardware or software upgrades required?
No

Could this product be overtaken by commercial/industry developments within the next two years?
No

Is there anything similar currently in use?
No

INITIATIVE: CUSTOMER

GOAL: INCREASE USE OF CADD/GIS TECHNOLOGY

PROJECT #: 01.040

TITLE: Simplify EIAP through Spatial Data Implementation

ORIGINATOR AND SERVICE PROPONENTS:
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REQUIREMENT AND OBJECTIVES:
Simplify EIAP through Full Spatial Data Implementation

The Environmental Impact Analysis Process (EIAP) is the Air Force's method for ensuring that compliance with the requirements of the National Environmental Policy Act (NEPA) is achieved. Robins Air Force Base (AFB) has already taken steps to automate this process under current procedures by utilizing information technology solutions such as Geographical Information Systems (GIS) and web-based applications. The next step being proposed is to reengineer the process itself to take full advantage of existing GIS capabilities. Full utilization would be accomplished through the following:

- Definition of project areas of potential effect (APEs) within the Robins AFB GIS at the time of the Description of Proposed Action and Alternatives (DOPAA)
- Automated spatial analysis of potential environmental impacts without need to display the location of sensitive resources

JUSTIFICATION:
Fully enabling the spatial components of EIAP at Robins AFB would facilitate a fully replicable chain of decisions as is required under NEPA, thereby providing the Air Force with a more complete administrative record to support its activities. Project proponents, managers, and analysts would be working from a centralized project information file through which they could trace the project's progress throughout its lifecycle; completing the automation of EIAP, which

has already begun at Robins AFB, could provide a model to be implemented across the Department of Defense.

COST:
Total Cost = $75,000

CUSTOMERS:
All environmental departments throughout DoD, and other Federal, State, and Local Governmental organizations.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Government Contractors - 100 offices
Other Agencies - 10 installations

What is the measurable time or cost savings with the implementation/use of this product?
Increased efficiency in meeting NEPA laws and regulations

What, if any, non-quantifiable benefits will be realized?
Increase accuracy and realiability of data

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?

INITIATIVE: CUSTOMER

GOAL: INCREASE CUSTOMER SATISFACTION

PROJECT #: 01.041

TITLE: Custodial Service Tracking System

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REQUIREMENT AND OBJECTIVES:
Request contract to develop software and graphical data to monitor basewide custodial services at Robins AFB. Three contractors perform custodial cleaning in 268 facilities (3.98 million sq ft) at an annual cost of $3.8 million. The Air Force manages these contracts using primitive one-line drawings with estimated square footages. A local cost study revealed that the inaccurate drawings result in an estimated 5.8% increase in square footage that is actually cleaned. Even if you cut that estimate in half to 2.9%, it equates to approximately 115,000 square feet that is not cleaned and an over payment of approximately $112,000 per year. This project will develop accurate floorplans and a tracking system necessary to afford true figures towards future custodial contracts. The cost for this work will be paid back many times over.

APPROACH:
Due to the large scope, the project would be done in four phases. Field verification and CADD work would be facilitated by government employees assigned at Robins AFB.

Phase 1 of the contract requires setting up a data base and tracking system, field verifying 50 facility floorplans, featurizing and attributing the plans, and creation of a cost analysis tool for managing the one of the three custodial contracts.

Phase 2 will duplicate efforts performed in phase 1 for an additional 75 facilities and complete the second of the three contracts.

Phase 3 will verify and add 75 facilities to the database.

PROJECT #: 01.041
TITLE: Custodial Service Tracking System – Page 2

Phase 4 would finish the project with the remaining 68 facilities.

COST:
Total Cost = $75,000

CUSTOMERS:
All environmental departments throughout DoD, and other Federal, State, and Local Governmental organizations.

GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA) REQUIREMENTS:
Once completed and fielded, how many offices will use the results of this Project?
Army - 80 installations
Corps - 41 district offices
Navy - 110 installations
Air Force - 110 installations
Government Contractors - 100 offices
Other Agencies - 10 installations

What is the measurable time or cost savings with the implementation/use of this product?
A local cost study revealed that the inaccurate drawings result in an estimated 5.8% increase in square footage that is actually cleaned. Even if you cut that estimate in half to 2.9%, it equates to approximately 115,000 square feet that is not cleaned and an over payment of approximately $112,000 per year. B/C ratio = 1.49/1

What, if any, non-quantifiable benefits will be realized?
Increase accuracy and realiability of data

Are commercial-off-the-shelf alternative products available?
No

If yes, what products?

Does the project conform to current technology?
Yes

Does the project identify well-defined stages of development with clear completion points?
Yes

Is training required for the product?
No

If yes, how many people per agency?

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TITLE: Custodial Service Tracking System – Page 3

Are hardware or software upgrades required?
No

If yes, at what cost per workstation and/or user?

Could this product be overtaken by commercial/industry developments within the next 2 years?
No

Is there anything similar currently in use?
No

If yes, what?